MultiPower 460

DC WELDING POWER SOURCE

(Shipyard Model)

INSTRUCTION MANUAL

ESAB ITEM NO. 0558003401, MultiPower 460 - 230/460/575 vac, 3 ph., 60 Hz

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BE SURE THIS INFORMATION REACHES THE OPERATOR.
YOU CAN GET EXTRA COPIES THROUGH YOUR SUPPLIER.

CAUTION

These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for arc welding and cutting equipment, we urge you to read our booklet, "Precautions and Safe Practices for Arc Welding, Cutting, and Gouging," Form 52-529. Do NOT permit untrained persons to install, operate, or maintain this equipment. Do NOT attempt to install or operate this equipment until you have read and fully understand these instructions. If you do not fully understand these instructions, contact your supplier for further information. Be sure to read the Safety Precautions before installing or operating this equipment.

USER RESPONSIBILITY

This equipment will perform in conformity with the description thereof contained in this manual and accompanying labels and/or inserts when installed, operated, maintained and repaired in accordance with the instructions provided. This equipment must be checked periodically. Malfunctioning or poorly maintained equipment should not be used. Parts that are broken, missing, worn, distorted or contaminated should be replaced immediately. Should such repair or replacement become necessary, the manufacturer recommends that a telephone or written request for service advice be made to the Authorized Distributor from whom it was purchased.

This equipment or any of its parts should not be altered without the prior written approval of the manufacturer. The user of this equipment shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, damage, improper repair or alteration by anyone other than the manufacturer or a service facility designated by the manufacturer.

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WARNING: These Safety Precautions are for your protection. They summarize precautionary information from the references listed in Additional Safety Information section. Before performing any installation or operating procedures, be sure to read and follow the safety precautions listed below as well as all other manuals, material safety data sheets, labels, etc. Failure to observe Safety Precautions can result in injury or death.

PROTECT YOURSELF AND OTHERS -- Some welding, cutting, and gouging processes are noisy and require ear protection. The arc, like the sun, emits ultraviolet (UV) and other radiation and can injure skin and eyes. Hot metal can cause burns. Training in the proper use of the processes and equipment is essential to prevent accidents. Therefore:

1. Always wear safety glasses with side shields in any work area, even if welding helmets, face shields, and goggles are also required.
2. Use a face shield fitted with the correct filter and cover plates to protect your eyes, face, neck, and ears from sparks and rays of the arc when operating or observing operations. Warn bystanders not to watch the arc and not to expose themselves to the rays of the electric-arc or hot metal.
3. Wear flameproof gauntlet type gloves, heavy long-sleeve shirt, cuffless trousers, high-topped shoes, and a welding helmet or cap for hair protection, to protect against arc rays and hot sparks or hot metal. A flameproof apron may also be desirable as protection against radiated heat and sparks.
4. Hot sparks or metal can lodge in rolled up sleeves, trouser cuffs, or pockets. Sleeves and collars should be kept buttoned, and open pockets eliminated from the front of clothing
5. Protect other personnel from arc rays and hot sparks with a suitable nonflammable partition or curtains.
6. Use goggles over safety glasses when chipping slag or grinding. Chipped slag may be hot and can fly far. Bystanders should also wear goggles over safety glasses.

FIRES AND EXPLOSIONS -- Heat from flames and arcs can start fires. Hot slag or sparks can also cause fires and explosions. Therefore:

1. Remove all combustible materials well away from the work area or cover the materials with a protective nonflammable covering. Combustible materials include wood, cloth, sawdust, liquid and gas fuels, solvents, paints and coatings, paper, etc.
2. Hot sparks or hot metal can fall through cracks or crevices in floors or wall openings and cause a hidden smoldering fire or fires on the floor below. Make certain that such openings are protected from hot sparks and metal.“
3. Do not weld, cut or perform other hot work until the workpiece has been completely cleaned so that there are no substances on the workpiece which might produce flammable or toxic vapors. Do not do hot work on closed containers. They may explode.
4. Have fire extinguishing equipment handy for instant use, such as a garden hose, water pail, sand bucket, or portable fire extinguisher. Be sure you are trained in its use.
5. Do not use equipment beyond its ratings. For example, overloaded welding cable can overheat and create a fire hazard.
6. After completing operations, inspect the work area to make certain there are no hot sparks or hot metal which could cause a later fire. Use fire watchers when necessary.
7. For additional information, refer to NFPA Standard 51B, "Fire Prevention in Use of Cutting and Welding Processes", available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

ELECTRICAL SHOCK -- Contact with live electrical parts and ground can cause severe injury or death. DO NOT use AC welding current in damp areas, if movement is confined, or if there is danger of falling.

1. Be sure the power source frame (chassis) is connected to the ground system of the input power.
2. Connect the workpiece to a good electrical ground.
3. Connect the work cable to the workpiece. A poor or missing connection can expose you or others to a fatal shock.
4. Use well-maintained equipment. Replace worn or damaged cables.
5. Keep everything dry, including clothing, work area, cables, torch/electrode holder, and power source.
6. Make sure that all parts of your body are insulated from work and from ground.
7. Do not stand directly on metal or the earth while working in tight quarters or a damp area; stand on dry boards or an insulating platform and wear rubber-soled shoes.
8. Put on dry, hole-free gloves before turning on the power.
9. Turn off the power before removing your gloves.
10. Refer to ANSI/ASC Standard Z49.1 (listed on next page) for specific grounding recommendations. Do not mistake the work lead for a ground cable.

ELECTRIC AND MAGNETIC FIELDS — May be dangerous. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding and cutting current creates EMF around welding cables and welding machines. Therefore:

1. Welders having pacemakers should consult their physician before welding. EMF may interfere with some pacemakers.
2. Exposure to EMF may have other health effects which are unknown.
3. Welders should use the following procedures to minimize exposure to EMF:
   A. Route the electrode and work cables together. Secure them with tape when possible.
   B. Never coil the torch or work cable around your body.
   C. Do not place your body between the torch and work cables. Route cables on the same side of your body.
   D. Connect the work cable to the workpiece as close as possible to the area being welded.
   E. Keep welding power source and cables as far away from your body as possible.

FUMES AND GASES -- Fumes and gases, can cause discomfort or harm, particularly in confined spaces. Do not breathe fumes and gases. Shielding gases can cause asphyxiation. Therefore:

1. Always provide adequate ventilation in the work area by natural or mechanical means. Do not weld, cut, or gouge on materials such as galvanized steel, stainless steel, copper, zinc, lead, beryllium, or cadmium unless positive mechanical ventilation is provided. Do not breathe fumes from these materials.
2. Do not operate near degreasing and spraying operations. The heat or arc rays can react with chlorinated hydrocarbon vapors to form phosgene, a highly toxic gas, and other irritant gases.
3. If you develop momentary eye, nose, or throat irritation while operating, this is an indication that ventilation is not adequate. Stop work and take necessary steps to improve ventilation in the work area. Do not continue to operate if physical discomfort persists.
4. Refer to ANSI/ASC Standard Z49.1 (see listing below) for specific ventilation recommendations.
5. **WARNING: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code §25249.5 et seq.)**

CYLINDER HANDLING -- Cylinders, if mishandled, can rupture and violently release gas. Sudden rupture of cylinder, valve, or relief device can injure or kill. Therefore:

1. Use the proper gas for the process and use the proper pressure reducing regulator designed to operate from the compressed gas cylinder. Do not use adaptors. Maintain hoses and fittings in good condition. Follow manufacturer's operating instructions for mounting regulator to a compressed gas cylinder.
2. Always secure cylinders in an upright position by chain or strap to suitable hand trucks, undercarriages, benches, walls, post, or racks. Never secure cylinders to work tables or fixtures where they may become part of an electrical circuit.
3. When not in use, keep cylinder valves closed. Have valve protection cap in place if regulator is not connected. Secure and move cylinders by using suitable hand trucks. Avoid rough handling of cylinders.
4. Locate cylinders away from heat, sparks, and flames. Never strike an arc on a cylinder.
5. For additional information, refer to CGA Standard P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders", which is available from Compressed Gas Association, 1235 Jefferson Davis Highway, Arlington, VA 22202.

EQUIPMENT MAINTENANCE -- Faulty or improperly maintained equipment can cause injury or death. Therefore:

1. Always have qualified personnel perform the installation, troubleshooting, and maintenance work. Do not perform any electrical work unless you are qualified to perform such work.
2. Before performing any maintenance work inside a power source, disconnect the power source from the incoming electrical power.
3. Maintain cables, grounding wire, connections, power cord, and power supply in safe working order. Do not operate any equipment in faulty condition.
4. Do not abuse any equipment or accessories. Keep equipment away from heat sources such as furnaces, wet conditions such as water puddles, oil or grease, corrosive atmospheres and inclement weather.
5. Keep all safety devices and cabinet covers in position and in good repair.
6. Use equipment only for its intended purpose. Do not modify it in any manner.

ADDITIONAL SAFETY INFORMATION -- For more information on safe practices for electric arc welding and cutting equipment, ask your supplier for a copy of "Precautions and Safe Practices for Arc Welding, Cutting and Gouging", Form 52-529.

The following publications, which are available from the American Welding Society, 550 N.W. LeJuene Road, Miami, FL 33126, are recommended to you:

1. ANSI/ASC Z49.1 - "Safety in Welding and Cutting"
2. AWS C5.1 - "Recommended Practices for Plasma Arc Welding"
3. AWS C5.2 - "Recommended Practices for Plasma Arc Cutting"
4. AWS C5.3 - "Recommended Practices for Air Carbon Arc Gouging and Cutting"
5. AWS C5.5 - "Recommended Practices for Gas Tungsten Arc Welding"
6. AWS C5.6 - "Recommended Practices for Gas Metal Arc Welding""
7. AWS SP - "Safe Practices" - Reprint, Welding Handbook.
8. ANSI/AWS F4.1, "Recommended Safe Practices for Welding and Cutting of Containers That Have Held Hazardous Substances."

MEANING OF SYMBOLS - As used throughout this manual: Means Attention! Be Alert! Your safety is involved.

DANGER **Means immediate hazards which, if not avoided, will result in immediate, serious personal injury or loss of life.**

WARNING **Means potential hazards which could result in personal injury or loss of life.**

CAUTION **Means hazards which could result in minor personal injury.**

SECTION 1 PRECAUCION DE SEGURIDAD

ADVERTENCIA: Estas Precauciones de Seguridad son para su protección. Ellas hacen resumen de información proveniente de las referencias listadas en la sección "Información Adicional Sobre La Seguridad". Antes de hacer cualquier instalación o procedimiento de operación , asegúrese de leer y seguir las precauciones de seguridad listadas a continuación así como también todo manual, hoja de datos de seguridad del material, calcomanias, etc. El no observar las Precauciones de Seguridad puede resultar en daño a la persona o muerte.

PROTEJASE USTED Y A LOS DEMAS-- Algunos procesos de soldadura, corte y ranurado son ruidosos y requiren protección para los oídos. El arco, como el sol , emite rayos ultravioleta (UV) y otras radiaciones que pueden dañar la piel y los ojos. El metal caliente causa quemaduras. EL entrenamiento en el uso propio de los equipos y sus procesos es esencial para prevenir accidentes. Por lo tanto:

1. Utilice gafas de seguridad con protección a los lados siempre que esté en el área de trabajo, aún cuando esté usando careta de soldar, protector para su cara u otro tipo de protección.
2. Use una careta que tenga el filtro correcto y lente para proteger sus ojos, cara, cuello, y oídos de las chispas y rayos del arco cuando se esté operando y observando las operaciones. Alerte a todas las personas cercanas de no mirar el arco y no exponerse a los rayos del arco eléctrico o el metal fundido.
3. Use guantes de cuero a prueba de fuego, camisa pesada de mangas largas, pantalón de ruedo liso, zapato alto al tobillo, y careta de soldar con capucha para el pelo, para proteger el cuerpo de los rayos y chispas calientes provenientes del metal fundido. En ocaciones un delantal a prueba de fuego es necesario para protegerse del calor radiado y las chispas.
4. Chispas y partículas de metal caliente puede alojarse en las mangas enrolladas de la camisa , el ruedo del pantalón o los bolsillos. Mangas y cuellos deberán mantenerse abotonados, bolsillos al frente de la camisa deberán ser cerrados o eliminados.
5. Proteja a otras personas de los rayos del arco y chispas calientes con una cortina adecuada no-flamable como división.
6. Use careta protectora además de sus gafas de seguridad cuando esté removiendo escoria o puliendo. La escoria puede estar caliente y desprenderse con velocidad. Personas cercanas deberán usar gafas de seguridad y careta protectora.

FUEGO Y EXPLOSIONES -- El calor de las flamas y el arco pueden ocacionar fuegos. Escoria caliente y las chispas pueden causar fuegos y explosiones. Por lo tanto:

1. Remueva todo material combustible lejos del área de trabajo o cubra los materiales con una cobija a prueba de fuego. Materiales combustibles incluyen madera, ropa, líquidos y gases flamables, solventes, pinturas, papel, etc.
2. Chispas y partículas de metal pueden introducirse en las grietas y agujeros de pisos y paredes causando fuegos escondidos en otros niveles o espacios. Asegúrese de que toda grieta y agujero esté cubierto para proteger lugares adyacentes contra fuegos.
3. No corte, suelde o haga cualquier otro trabajo relacionado hasta que la pieza de trabajo esté totalmente limpia y libre de substancias que puedan producir gases inflamables o vapores tóxicos. No trabaje dentro o fuera de contenedores o tanques cerrados. Estos pueden explotar si contienen vapores inflamables.
4. Tenga siempre a la mano equipo extintor de fuego para uso instantáneo, como por ejemplo una manguera con agua, cubeta con agua, cubeta con arena, o extintor portátil. Asegúrese que usted esta entrenado para su uso.
5. No use el equipo fuera de su rango de operación. Por ejemplo, el calor causado por cable sobrecarga en los cables de soldar pueden ocasionar un fuego.
6. Después de termirar la operación del equipo, inspeccione el área de trabajo para cerciorarse de que las chispas o metal caliente ocasionen un fuego más tarde. Tenga personal asignado para vigilar si es necesario.
7. Para información adicional , haga referencia a la publicación NFPA Standard 51B, "Fire Prevention in Use of Cutting and Welding Processes", disponible a través de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

CHOQUE ELECTRICO -- El contacto con las partes eléctricas energizadas y tierra puede causar daño severo o muerte. NO use soldadura de corriente alterna (AC) en áreas húmedas, de movimiento confinado en lugares estrechos o si hay posibilidad de caer al suelo.

1. Asegúrese de que el chasis de la fuente de poder esté conectado a tierra através del sistema de electricidad primario.
2. Conecte la pieza de trabajo a un buen sistema de tierra física.
3. Conecte el cable de retorno a la pieza de trabajo. Cables y conductores expuestos o con malas conexiones pueden exponer al operador u otras personas a un choque eléctrico fatal.
4. Use el equipo solamente si está en buenas condiciones. Reemplaze cables rotos, dañados o con conductores expuestos.
5. Mantenga todo seco, incluyendo su ropa, el área de trabajo, los cables, antorchas, pinza del electrodo, y la fuente de poder.
6. Asegúrese que todas las partes de su cuerpo están insuladas de ambos, la pieza de trabajo y tierra.
7. No se pare directamente sobre metal o tierra mientras trabaja en lugares estrechos o áreas húmedas; trabaje sobre un pedazo de madera seco o una plataforma insulada y use zapatos con suela de goma.
8. Use guantes secos y sin agujeros antes de energizar el equipo.
9. Apage el equipo antes de quitarse sus guantes.
10. Use como referencia la publicación ANSI/ASC Standard Z49.1 (listado en la próxima página) para recomendaciones específicas de como conectar el equipo a tierra. No confunda el cable de soldar a la pieza de trabajo con el cable a tierra.

CAMPOS ELECTRICOS Y MAGNETICOS - Son peligrosos. La corriente eléctrica fluye através de cualquier conductor causando a nivel local Campos Eléctricos y Magnéticos (EMF). Las corrientes en el área de corte y soldadura, crean EMF alrrededor de los cables de soldar y las maquinas. Por lo tanto:

1. Soldadores u Operadores que use marca-pasos para el corazón deberán consultar a su médico antes de soldar. El Campo Electromagnético (EMF) puede interferir con algunos marca-pasos.
2. Exponerse a campos electromagnéticos (EMF) puede causar otros efectos de salud aún desconocidos.
3. Los soldadores deberán usar los siguientes procedimientos para minimizar exponerse al EMF:
   A. Mantenga el electrodo y el cable a la pieza de trabajo juntos, hasta llegar a la pieza que usted quiere soldar. Asegúrelos uno junto al otro con cinta adhesiva cuando sea posible.
   B. Nunca envuelva los cables de soldar alrededor de su cuerpo.
   C. Nunca ubique su cuerpo entre la antorcha y el cable, a la pieza de trabajo. Mantega los cables a un sólo lado de su cuerpo.
   D. Conecte el cable de trabajo a la pieza de trabajo lo más cercano posible al área de la soldadura.
   E. Mantenga la fuente de poder y los cables de soldar lo más lejos posible de su cuerpo.

HUMO Y GASES -- El humo y los gases, pueden causar malestar o daño, particularmente en espacios sin ventilación. No inhale el humo o gases. El gas de protección puede causar falta de oxígeno. Por lo tanto:

1. Siempre provea ventilación adecuada en el área de trabajo por medio natural o mecánico. No solde, corte, o ranure materiales con hierro galvanizado, acero inoxidable, cobre, zinc, plomo, berílio, o cadmio a menos que provea ventilación mecánica positiva. No respire los gases producidos por estos materiales.
2. No opere cerca de lugares donde se aplique substancias químicas en aerosol. El calor de los rayos del arco pueden reaccionar con los vapores de hidrocarburo clorinado para formar un fosfógeno, o gas tóxico, y otros irritant es.
3. Si momentáneamente desarrolla inrritación de ojos, nariz o garganta mientras est á operando, es indicación de que la ventilación no es apropiada. Pare de trabajar y tome las medidas necesarias para mejorar la ventilación en el área de trabajo. No continúe operando si el malestar físico persiste.
4. Haga referencia a la publicación ANSI/ASC Standard Z49.1 (Vea la lista a continuación) para recomendaciones específicas en la ventilación.

5. ADVERTENCIA-- Este producto cuando se utiliza para soldaduras o cortes, produce humos o gases, los cuales contienen químicos conocidos por el Estado de California de causar defectos en el nacimiento, o en algunos casos, Cancer. (California Health & Safety Code §25249.5 et seq.)

MANEJO DE CILINDROS-- Los cilindros, si no son manejados correctamente, pueden romperse y liberar violentamente gases. Rotura repentina del cilindro, válvula, o válvula de escape puede causar daño o muerte. Por lo tanto:

1. Utilize el gas apropiado para el proceso y utilize un regulador diseñado para operar y reducir la presión del cilindro de gas . No utilice adaptadores. Mantenga las mangueras y las conexiones en buenas condiciones. Observe las instrucciones de operación del manufacturero para montar el regulador en el cilindro de gas comprimido.
2. Asegure siempre los cilindros en posición vertical y amárrelos con una correa o cadena adecuada para asegurar el cilindro al carro, transportes, tablilleros, paredes, postes, o armazón. Nunca asegure los cilindros a la mesa de trabajo o las piezas que son parte del circuito de soldadura . Este puede ser parte del circuito elélectrico.
3. Cuando el cilindro no está en uso, mantenga la válvula del cilindro cerrada. Ponga el capote de protección sobre la válvula si el regulador no está conectado. Asegure y mueva los cilindros utilizando un carro o transporte adecuado. Evite el manejo brusco de los cilindros.
4. Localize los cilindros lejos del calor, chispas, y flamas. Nunca establezca un arco en el cilindro.
5. Para información adicional, haga referencia a la publicación CGA Standard P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders", disponible através del Compressed Gas Association, 1235 Jefferson Davis Highway, Arlington, VA 22202.

MANTENIMIENTO DEL EQUIPO -- Equipo defectuoso o mal mantenido puede causar daño o muerte. Por lo tanto:

1. Siempre tenga personal cualificado para efectuar l a instalación, diagnóstico, y mantenimiento del equipo. No ejecute ningún trabajo eléctrico a menos que usted esté cualificado para hacer el trabajo.
2. Antes de dar mantenimiento en el interior de la fuente de poder, desconecte la fuente de poder del suministro de electricidad primaria.
3. Mantenga los cables, cable a tierra, conexciones, cable primario, y cualquier otra fuente de poder en buen estado operacional. No opere ningún equipo en malas condiciones.
4. No abuse del equipo y sus accesorios. Mantenga el equipo lejos de cosas que generen calor como hornos, también lugares húmedos como charcos de agua , aceite o grasa, atmósferas corrosivas y las inclemencias del tiempo.
5. Mantenga todos los artículos de seguridad y coverturas del equipo en su posición y en buenas condiciones.
6. Use el equipo sólo para el propósito que fue diseñado. No modifique el equipo en ninguna manera.

INFORMACION ADICIONAL DE SEGURIDAD -- Para más información sobre las prácticas de seguridad de los equipos de arco eléctrico para soldar y cortar, pregunte a su suplidor por una copia de "Precautions and Safe Practices for Arc Welding, Cutting and Gouging-Form 52-529.

Las siguientes publicaciones, disponibles através de la American Welding Society, 550 N.W. LeJuene Road, Miami, FL 33126, son recomendadas para usted:

1. ANSI/ASC Z49.1 - "Safety in Welding and Cutting"
2. AWS C5.1 - "Recommended Practices for Plasma Arc Welding"
3. AWS C5.2 - "Recommended Practices for Plasma Arc Cutting"
4. AWS C5.3 - "Recommended Practices for Air Carbon Arc Gouging and Cutting"
5. AWS C5.5 - "Recommended Practices for Gas Tungsten Arc Welding"
6. AWS C5.6 - "Recommended Practices for Gas Metal Arc Welding""
7. AWS SP - "Safe Practices" - Reprint, Welding Handbook.
8. ANSI/AWS F4.1, "Recommended Safe Practices for Welding and Cutting of Containers That Have Held Hazardous Substances."

SIGNIFICADO DE LOS SIMBOLOS -- Según usted avanza en la lectura de este folleto: Los Símbolos Significan ¡Atención! ¡Esté Alerta! Se trata de su seguridad.

PELIGRO **Significa riesgo inmediato que, de no ser evadido, puede resultar inmediatamente en serio daño personal o la muerte.**

ADVERTENCIA **Significa el riesgo de un peligro potencial que puede resultar en serio daño personal o la muerte.**

CUIDADO **Significa el posible riesgo que puede resultar en menores daños a la persona.**

AVERTISSEMENT: Ces règles de sécurité ont pour objet d' assurer votre protection. Veillez à lire et à observer les précautions énoncées ci-dessous avant de monter l' équipement ou de commercer à l'utiliser. Tout défaut d'observation de ces précautions risque d'entraîner des blessures graves ou mortelles.

1. PROTECTION INDIVIDUELLE-- Les brûlures de la peau et des yeux dues au rayonnement de l'arc électrique ou du métal incandescent, lors du soudage au plasma ou à l'électrode ou lors du gougeage à l'arc, peuvent s'avérer plus graves que celles résultant d'une exposition prolongée au soleil. Aussi convient-il d'observer les précautions suivantes:

a. Portez un écran facial adéquat muni des plaques protectrices et des verres filtrants appropriés afin de vous protéger les yeux, le visage, le cou et les oreilles des étincelles et du rayonnement de l'arc électrique lorsque vous effectuez des soudures ou des coupes ou lorsque vous en observez l'exécution.
AVERTISSEZ les personnes se trouvant à proximité de façon à ce qu'elles ne regardent pas l'arc et à ce qu'elles ne s'exposent pas à son rayonnement, ni à celui du métal incandescent.

b. Portez des gants ignifugés à crispins, une tunique épaisse à manches longues, des pantalons sans rebord, des chaussures à embout d'acier et un casque de soudage ou une calotte de protection, afin d'éviter d'exposer la peau au rayonnement de l'arc électrique ou du métal incandescent. Il est également souhaitable d'utiliser un tablier ininflammable de façon à se protéger des étincelles et du rayonnement thermique.

c. Les étincelles ou les projections de métal incandescent risquent de se loger dans des manches retroussées, des bords relevés de pantalons ou dans des poches. Aussi convient-il de garder boutonnés le col et les manches et de porter des vêtements sans poches à l'avant.

d. Protégez des étincelles et du rayonnement de l'arc électrique les autres personnes travaillant à proximité à l'aide d'un écran ininflammable adéquat.

e. Ne jamais omettre de porter des lunettes de sécurité lorsque vous vous trouvez dans un secteur où l'on effectue des opérations de soudage ou de coupage à l'arc. Utilisez des lunettes de sécurité à écrans ou verres latéraux pour piquer ou meûler le laitier. Les piquetures incandescentes de laitier peuvent être projetées à des distances considérables. Les personnes se trouvant à proximité doivent également porter des lunettes de protection.

f. Le gougeage à l'arc et le soudage à l'arc au plasma produisent un niveau de bruit extrêmement élevé (de 100 à 114 dB) et exigent par conséquent l'emploi de dispositifs appropriés de protection auditive.

2. PRÉVENTION DES INCENDES-- Les projections de laitier incandescent ou d'étincelles peuvent provoquer de graves incendies au contact de matériaux combustibles solides, liquides ou gazeux. Aussi faut-il observer les précautions suivantes:

a. Éloigner suffisamment tous les matériaux combustibles du secteur où l'on exécute des soudures ou des coupes à l'arc, à moins de les recouvrir complètement d'une bâche non-inflammable. Ce type de matériaux comprend notamment le bois, les vêtements, la sciure, l'essence, le kérosène, les peintures, les solvants, le gaz naturel, l'acétylène, le propane et autres substances combustibles semblables.

b. Les étincelles ou les projections de métal incandescent peuvent tomber dans des fissures du plancher ou dans des ouvertures des murs et y déclencher une ignition lente cachée. Veiller à protéger ces ouvertures des étincelles et des projections de métal.

c. N'exécutez pas de soudures, de coupes, d'opérations de gougeage ou autres travaux à chaud à la surface de barils, bidons, réservoirs ou autres contenants usagés, avant de les avoir nettoyés de toute trace de substance susceptible de produire des vapeurs inflammables ou toxiques.

d. En vue d'assurer la prévention des incendies, il convient de disposer d'un matériel d'extinction prêt à servir immédiatement, tel qu'un tuyau d'arrosage, un seau à eau, un seau de sable ou un extincteur portatif.

e. Une fois le travail à l'arc terminé, inspectez le secteur de façon à vous assurer qu'aucune étincelle ou projection de métal incandescent ne risque de provoquer ultérieurement un feu.

3. CHOC ÉLECTRIQUE-- Le gougeage à l'arc et à l'arc au plasma exige l'emploi de tensions à vide relativement importantes; or, celles-ci risquent de causer des dommages corporels graves et même mortels en cas d'utilisation inadéquate. La gravité du choc électrique reçu dépend du chemin suivi par le courant à travers le corps humain et de son intensité.

a. Ne laissez jamais de surfaces métalliques sous tension venir au contact direct de la peau ou de vêtements humides. Veillez à porter des gants bien secs.

b. Si vous devez effectuer un travail sur une surface métallique ou dans un secteur humide, veillez à assurer votre isolation corporelle en portant des gants secs et des chaussures à semelles de caoutchouc et en vous tenant sur une planche ou une plate-forme sèche.

c. Mettez toujours à la terre le poste de soudage/coupage en le reliant par un câble à une bonne prise de terre.

d. N'utilisez jamais de câbles usés ou endommagés. Ne surchargez jamais le câble. Utilisez toujours un équipement correctement entretenu.

e. Mettez l'équipement hors tension lorsqu'il n'est pas en service. une mise à la masse accidentelle peut en effet provoquer une surchauffe de l'équipement et un danger d'incendie. Ne pas enrouler ou passer le câble autour d'une partie quelconque du corps.

f. Vérifiez si le câble de masse est bien relié à la pièce en un point aussi proche que possible de la zone de travail. Le branchement des câbles de masse à l'ossature du bâtiment ou en un point éloigné de la zone de travail augmente en effet le risque de passage d'un courant de sortie par des chaînes de

levage, des câbles de grue ou divers chemins électriques.

g. Empêchez l'apparition de toute humidité, notamment sur vos vêtements, à la surface de l'emplacement de travail, des câbles, du porte-électrode et du poste de soudage/coupage. Réparez immédiatement toute fuite d'eau.

4. VENTILATION-- La respiration prolongée des fumées résultant des opérations de soudage/coupage, à l'intérieur, d'un local clos, peut provoquer des malaises et des dommages corporels. Aussi convient-il d'observer les précautions suivantes:

a. Assurez en permanence une aération adéquate de l'emplacement de travail en maintenant une ventilation naturelle ou à l'aide de moyens mécaniques. N'effectuez jamais de travaux de soudage ou de coupage sur des matériaux de zinc, de plomb, de beryllium ou de cadmium en l'absence de moyens mécaniques de ventilation capables d'empêcher l'inhalation des fumées dégagées par ces matériaux.

b. N'effectuez jamais de travaux de soudage ou de coupage à proximité de vapeurs d'hydrocarbure chloré résultant d'opérations voisines de dégraissage ou de pulvérisation. La chaleur dégagée ou le rayonnement de l'arc peut déclencher la formation de phosgène -- gaz particulièrement toxique -- et d'autres gaz irritants, à partir des vapeurs de solvant.

c. Une irritation momentanée des yeux, du nez ou de la gorge constatée au cours de l'utilisation de l'équipement dénote un défaut de ventilation. Arrêtez-vous de travailler afin de prendre les mesures néces- saires à l'amélioration de la ventilation. Ne poursuivez pas l'opération entreprise si le malaise persiste.

d. Certaines commandes comportent des canalisations où circule de l'hydrogène. L'armoire de commande est munie d'un ventilateur destiné à empêcher la formation de poches d'hydrogène, lesquelles présentent un danger d'explosion; ce ventilateur ne fonctionne que si l'interrupteur correspondant du panneau avant se trouve placé en position ON (Marche). Veillez à manœuvrer cette commande en vérifiant si le couvercle est bien en place, de façon à assurer l'efficacité de la ventilation ainsi réalisée. Ne jamais débrancher le ventilateur.

e. Les fumées produites par l'opération de soudage ou de coupage peuvent s'avérer toxiques. Aussi est-il nécessaire de disposer en permanence d'un dispositif adéquat de ventilation de type aspirant, afin d'élimi-ner du voisinage de l'opérateur tout dégagement de fumée visible.

f. Consultez les recommandations particulières en matière de ventilation indiquées à l'alinéa 6 de la norme Z49.1 de l'AWS.

5. ENTRETIEN DE L'ÉQUIPEMENT-- Un équipement entretenu de façon défectueuse ou inadéquate risque non seulement de réaliser un travail de mauvaise qualité mais, chose plus grave encore, d'entraîner des dommages corporels graves, voire mortels en déclenchant des incendies ou des chocs électriques. Observez par conséquent les précautions suivantes:

a. Efforcez-vous de toujours confier à un personnel qualifié l'installation, le dépannage et l'entretien du poste de soudage et de coupage. N'effectuez aucune réparation électrique sur l'équipement à moins d'être qua-lifié à cet effet.

b. Ne procédez jamais à une tâche d'entretien quelconque à l'intérieur du poste de soudage/coupage, avant d'avoir débranché l'alimentation électrique.

c. Maintenez en bon état de fonctionnement les câbles, le câble de masse, les branchements, le cordon d'alimentation et le poste de soudage/coupage. N'utilisez jamais le poste ou l'équipement s'il présente une défectuosité quelconque.

d. Prenez soin du poste de soudage et de coupage et des équipements accessoires. Gardez-les à l'écart des sources de charleur, notamment des fours, de l'humidité, des flaques d'eau maintenez-les à l'abri des traces d'huile ou de graisse, des atmosphères corrosives et des intempéries.

e. Laissez en place tous les dispositifs de sécurité et tous les panneaux de l'armoire de commande en veillant à les garder en bon état.

f. Utilisez le poste de soudage/coupage conformément à son usage prévu et n'effectuez aucune modification.

6. INFORMATIONS COMPLÉMENTAIRES RELATIVES À LA SÉCURITÉ--

Pour obtenir des informations complémentaires sur les règles de sécurité à observer pour le montage et l'utilisation d'équipements de soudage et de coupage électriques et sur les méthodes de travail recommandées, demandez un exemplaire du livret N° 52529 "Precautions and Safe Practices for Arc Welding, Cutting and Gouging" publié par ESAB. Nous conseillons également de consulter les publications sui-vantes, tenues à votre disposition par l'American Welding Society, 550 N.W. LeJuene Road, Miami, FL 32126:

a. "Safety in Welding and Cutting" AWS Z49.1

b. "Recommended Safe Practices for Gas-Shielded Arc Welding "AWS A6. 1.

c. "Safe Practices for Welding and Cutting Containers That Have Held Combustibles" AWS-A6.0.

d. "Recommended Safe Practices for Plasma Arc Cutting" AWS-A6. 3.

e. "Recommended Safe Practices for Plasma Arc Welding" AWS-C5. 1.

f. "Recommended Safe Practices for Air Carbon Arc Gouging and Cutting" AWS-C5. 3.

g. "Code For Safety in Welding and Cutting" CSA-Standard W117. 2.

2.0. GENERAL

Before the MultiPower 460 power source is put into operation, the safety section at the front of this manual should be read completely. This will help avoid possible injury due to misuse or improper installation.

The definitions relating to the safety notations below:

are described at the end of the Safety Section in the front of this manual — **read them and their specific text references carefully.**

2.1. DESCRIPTION

This manual has been prepared for use by an experienced operator. It provides information to familiarize the operator with the design, installation and operation of the MultiPower 460 power source. DO NOT attempt to install or operate this equipment until you have read and fully understood these instructions. The information presented here should be given careful consideration to ensure proper installation and optimum weld performance of this equipment.

Table 2-1. Specifications for MultiPower 460

OPEN CIRCUIT VOLTAGE (U_2)				80V DC Max.	
RATED OUTPUT	DUTY CYCLE			60%	100%
	Current (I_2)			500 A	450 A
	Voltage (U_2)			40 V	38 V
RATED INPUT	3 Phase	60 Hz	Volts (U_1)	Current (I_1) Flat	Current (I_1) Flat
			208/230 V	76 A	66 A
			460 V	38 A	33 A
			575 V	31 A	26 A
		50 Hz	220 V	79 A	68 A
			400 V	43 A	37 A
Power Factor at Rated Output				89%	
Welding Range				10 A/12 V - 500 A/40 V	
Auxiliary Power				115 V ac @ 10 A, 60 Hz	
PHYSICAL SPECIFICATIONS					
Height (without lift eye)				25.0" (62.2 cm)	
Width				18.8" (48.3 cm)	
Depth				32.5" (81.9 cm)	
Net Weight				322lbs (146 kg)	
Shipping Weight				375lbs (170 kg)	

The MultiPower 460 is a multi-process power source designed for Mig short circuiting, spray transfer (GMAW), flux core (FCAW), Tig (GTAW), and stick (SMAW) welding and air carbon arc cutting/gouging (CAC-A) applications. Table 2-1 outlines the electrical and physical specifications.

A. POWER SOURCE

The power source is a constant current (CC) and constant voltage (CV), three phase, secondary chopper dc design with solid state contactor and control circuitry. It provides the volt-ampere characteristics desired for conventional MIG and flux core arc welding in the CV (constant voltage) mode or stick welding, Tig (GTAW) and arc gouging in the CC (constant current) mode.

Features

- Auto Fan - The MultiPower 460 fan will run when the power source is first powered up and will continue running for 6 minutes, then shut down. The fan will start again when welding begins and at current levels above 50 amps. The fan will remain running for 6 minutes after welding stops and then shut down automatically.
- Stainless steel frame for environmental durability.
- Durable composite side and top panels will not corrode.
- 100% duty cycle output at 450 amps.
- Compatible with all ESAB 42 vac wire feeders.

B. VOLT - AMPERE CHARACTERISTICS

The curves shown in Figure 2-2 represent the static volt-ampere characteristics for the power source. The slant of these curves is referred to as the "slope" and is generally defined as the voltage drop per 100 amperes of current use. These curves show the output voltage available at any given output current from the minimum to the maximum setting of the voltage/current control.

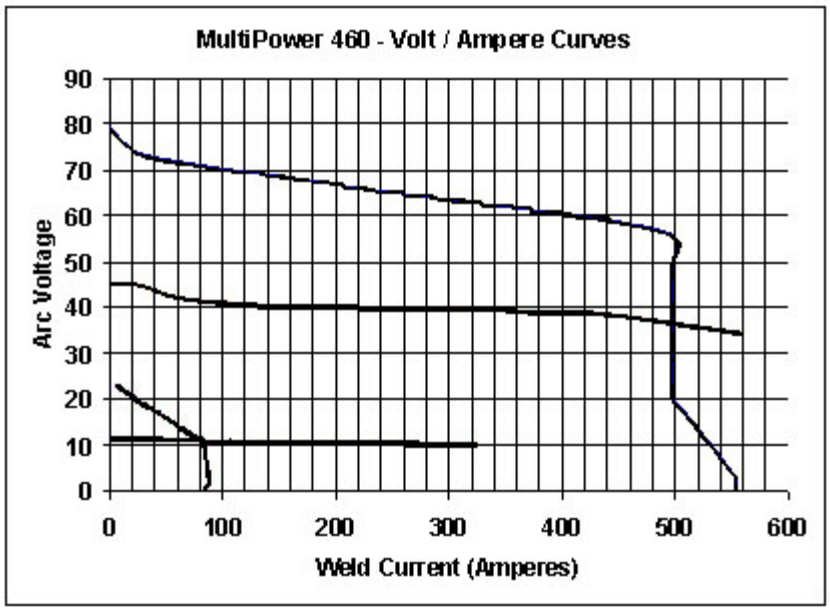


Figure 2-2 - MultiPower 460 Volt-Ampere Curves

C. CONTROL PANEL DESCRIPTION

(Refer to Figures 2-3 and 2-4)

1. FAULT LAMP

The RED fault light on the MultiPower 460 front panel indicates a problem with set-up parameters.

2. TEMPERATURE LAMP

The TEMP lamp illuminates if an over temperature condition occurs within the MultiPower 460 power source. This condition may be caused by excessive duty cycle or over-current conditions. When an over temperature condition occurs, the welding output is turned off and the unit must be allowed to cool. The machine will automatically reset when the temperature falls to a safe level.

3. PROCESS SELECTOR SWITCH

The three position process selector switch is located in the upper right-hand corner of the control panel. The process selector switch position provides the visual indication of which weld process (Mig, Tig or stick) has been selected.

4. DIGITAL DISPLAY/METERS (WFS, AMPS & VOLTS)

The digital displays located on the left side of the control panel are multifunctional depending on the welding process being used. The top display reads wire feed speed in inches per minute in the MIG PRESET mode and welding current (amps) in the TIG and STICK PRESET mode. During welding both displays indicate average welding current and average welding voltage.

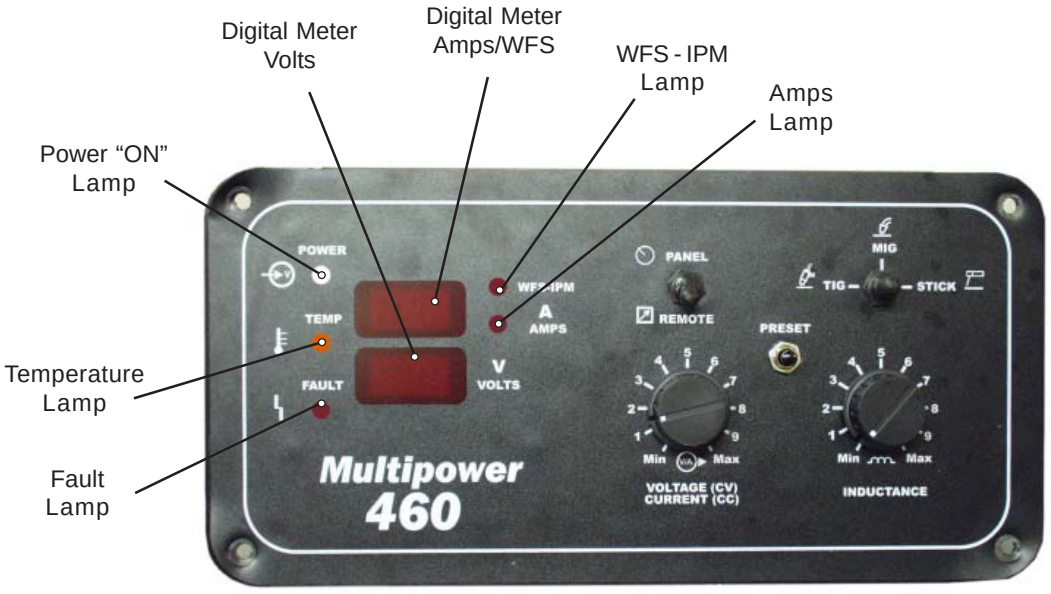


Figure 2-3. Control Panel

When using a DuraDrive 4-30 or DuraDrive 4-48 Wire Feeder, the wire feed speed is displayed in inches per minute (IPM) in the top display when the PRESET button is pressed and the wire speed adjustment knob on the wire feeder is rotated. The WFS LED beside the top display meter will light when the display is showing wire feed speed.

5. VOLTAGE / CURRENT / TRIM

The arc voltage is controlled with this knob when the WELD PROCESS selector switch is in the MIG position. The Mig arc voltage can be preset by pressing the PRESET button and reading the arc volts in the bottom digital display while rotating this knob.

The arc current is controlled with this knob when the WELD PROCESS SWITCH is in the TIG or STICK position. The welding current can be preset in amperes by pressing the PRESET button and reading the current (amps) in the top digital display while rotating this knob. The average weld current will be displayed during welding.

NOTE:
A DuraDrive Wire Feeder is required to preset wire feed speed.

6. PANEL/REMOTE SWITCH

With this switch in the PANEL position, output voltage in the CV mode and the output current in the CC mode are controlled by adjusting the VOLTAGE/ CURRENT/TRIM knob on the power source control panel to the desired output. In the REMOTE position, output is controlled using a remote control device such as a wire feeder, hand control or foot control.

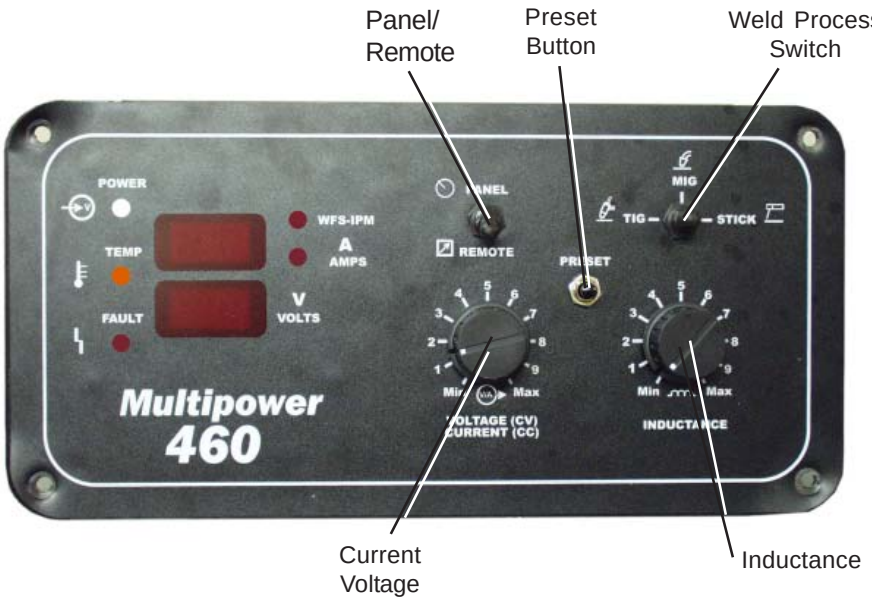


Figure 2-4. Control Panel

7. INDUCTANCE TRIM

This control is deactivated in the TIG and STICK modes.

Inductance is used to optimize short circuiting arc performance by changing the current rise and fall time of each short circuit. This results in improved spatter control, weld bead wetting and arc stability. The short circuiting Mig arc performance will change from a high short circuit frequency, fast reacting arc, to a lower short circuit frequency, soft and less spattering arc as the dial is turned clockwise. The optimized arc performance will vary depending on shielding gas, wire type and wire diameter. The operator can adjust this control to optimize welding characteristics.

D. POWER SOURCE FRONT PANEL DESCRIPTION

(Refer to Figure 2-5)

1. POWER ON/OFF SWITCH & LAMP

The main power switch is located on the right front panel of the power source. This switch energizes the main transformer, control circuitry and illuminates the Power “ON” lamp.

2. WIRE FEEDER CONTROL RECEPTACLE

This 19-pin receptacle (J1) accepts the control cable from the wire feeder and handles all the control signals needed to operate a 42 Vac wire feeder.

3. REMOTE CONTROL RECEPTACLE

This receptacle (J2) is provided for an optional 14-pin control cable from the optional remote pendant, Tig torch control or foot control . This receptacle is operative only if the PANEL/REMOTE switch on the power source front panel is in the "REMOTE" position.

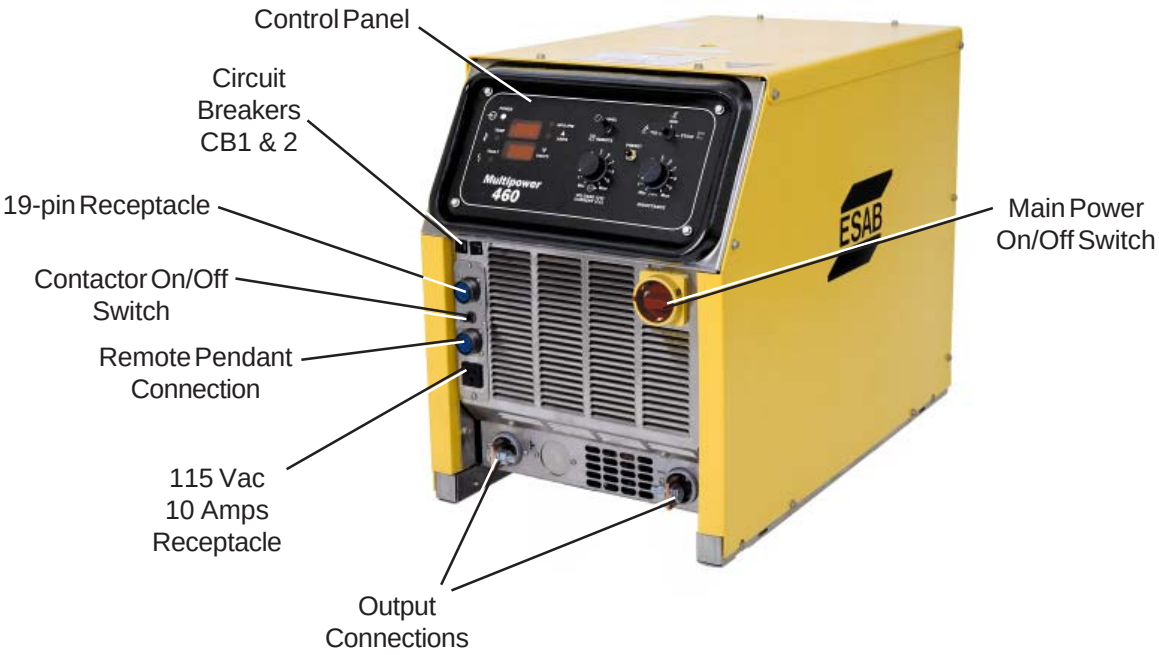


Figure 2-5. MultiPower 460

4. CONTACTOR "ON/OFF" SWITCH

This switch provides manual control of the welding contactor when the PROCESS switch on the control panel is in the MIG position (CV welding). An example of when to use this switch is when CV carbon arc gouging is needed or an "Off the Arc" wire feeder with secondary contactor is operated in the CV mode.

5. AUXILIARY 115 VAC RECEPTACLE

A 115 Vac receptacle is provided to supply power to accessories such as a water cooler, heated CO_2 regulator, or small hand tools. The receptacle is rated 115 Vac / 10 amps with a floating neutral.

6. 42VAC AND 115 VAC CIRCUIT BREAKER (CB1 & CB2)

These resetable 10 amp circuit breakers (CB1 & CB2) protect the 42 volt wire feeder/control and 115 volt auxiliary receptacle circuitry against over current. (Table 5-1 provides troubleshooting information).

E. OPTIONAL ACCESSORIES

1. REMOTE HAND CONTROL (PN - 0558002871)

This pendant (Figure 2-6) provides remote output control and a contactor closure switch to close the contactor making the output terminals “hot”. The PANEL/REMOTE switch on the MultiPower 460 control panel must be placed in the REMOTE position when using this accessory. The pendant has the capability to change weld processes as well as adapt to digital and analog wire feeders.

2. TR-29 TRUCK KIT (PN - 37924)

This truck kit provides complete mobility of the power source. The kit consists of front castors, rear cylinder rack and wheels, gas cylinder bracket, cylinder chain, and pull handle.

3. SWIVEL MOUNT KIT (PN - 36172)

This kit allows the wire feeder to be placed on an insulated swivel post on top of the power source. The feeder can freely rotate, relieving potential wire feed problems caused by sharp bends in the gun cable while, at the same time, increasing the radius of the working area.

4. PULSE MIG UPGRADE KIT (PN - 0558002671)

This kit adds pulse gas metal arc welding capability to the MultiPower 460 and includes and new control front panel.

NOTE
The FC-5B foot control or TC-2B hand control must be used with the MP-460 for remote current Tig current control.

NOTE
If a Foot Control or Remote Hand Control is used for continuous current control, place the PANEL/REMOTE switch in the PANEL POSITION and set the Panel Current knob to the maximum desired weld current. The remote device will then control the current between minimum and the maximum setting preset (proportional current control). Maximum Tig weld current is 525 amps.

NOTE
If the MP-460 PANEL/REMOTE switch is left in the REMOTE position when Tig welding while using a remote current control device, the current range will be full scale or 10 to 400 Amps. Limiting the the Maximum weld current on the MP-460 front panel is defeated.

NOTE
When using a DuraDrive wire feeder (or any wire feeder with Remote Voltage control from the feeder front panel) connected simultaneously with a remote current control Tig device (FC-5B or TC-2B), proportional control of the TIG remote current will be controlled by the position of the feeder voltage control knob when the PANEL/REMOTE switch is in the REMOTE position. When in the PANEL position the maximum current of the remote device is controlled by the MP-460 front panel current control preset.

Figure 2-6. Remote Control Pendant

5. TIG REMOTE CONTROLS

The following Remote controls are available for the Tig welding:

FC-5B EHD Foot Control	33841
FC-5B Foot Control	33838
TC-2B Torch Mount Control	33839
TC-3A Torch Mount On/Off only:	
(HW-9, 17, 20, 20A & 24)	35783
(HW-18 & 26R)	36680

3.0. INSTALLATION

A. LOCATION

A proper installation site is necessary for the power source to provide dependable service. A proper installation site permits freedom of air movement through the unit while minimizing exposure to dust, dirt, moisture, and corrosive vapors. A minimum of 18 inches (46 cm) is required between the side and rear panels of the power source and the nearest obstruction.

The selected site should also allow easy removal of the power source outer enclosure for maintenance. See Table 2-1 for overall dimensions of the unit.

B. RECEIVING, UNPACKING AND PLACEMENT

When requesting information concerning this equipment, it is essential that Item number, Serial number and Model number of the equipment be supplied.

CAUTION

For lifting purposes and for keeping dust, moisture, and other foreign material from entering the power source, the lifting eyebolt must be fully tightened with a tool.

CAUTION

Do not use filters on this unit as they would restrict the volume of intake air required for proper cooling. Output ratings on this unit are based on an unobstructed supply of cooling air drawn over its internal components. Warranty is void if any type of filtering device is used.

a. Upon receipt, remove all packing material and carefully inspect for any damage that may have occurred during shipment. Any claims for loss or damage that may have occurred in transit must be filed by the purchaser with the carrier. A copy of the bill of lading and freight bill will be furnished by the carrier on request.
b. Remove the power source from the container. Remove all packing materials. Check the container for any loose parts.
c. Check air passages at front and rear of cabinet, making sure that packing material has not obstructed air flow through the power source.
d. Install the lifting bolt furnished with the power sources into the top of the unit.
e. After selecting an installation site, place the power source in the desired location. The unit may be lifted either by using the lifting bolt or by forklift truck. If a forklift is used for lifting the unit, be sure that the lift forks are long enough to extend completely under the base.

C. PRIMARY (INPUT) ELECTRICAL CONNECTION

This power source is a three-phase unit and must be connected to a three-phase power supply. It is recommended that the unit be operated on a dedicated circuit to prevent impairment of performance due to an overloaded circuit.

Table 3-1. Recommended Sizes for Input Conductors and Line Fuses

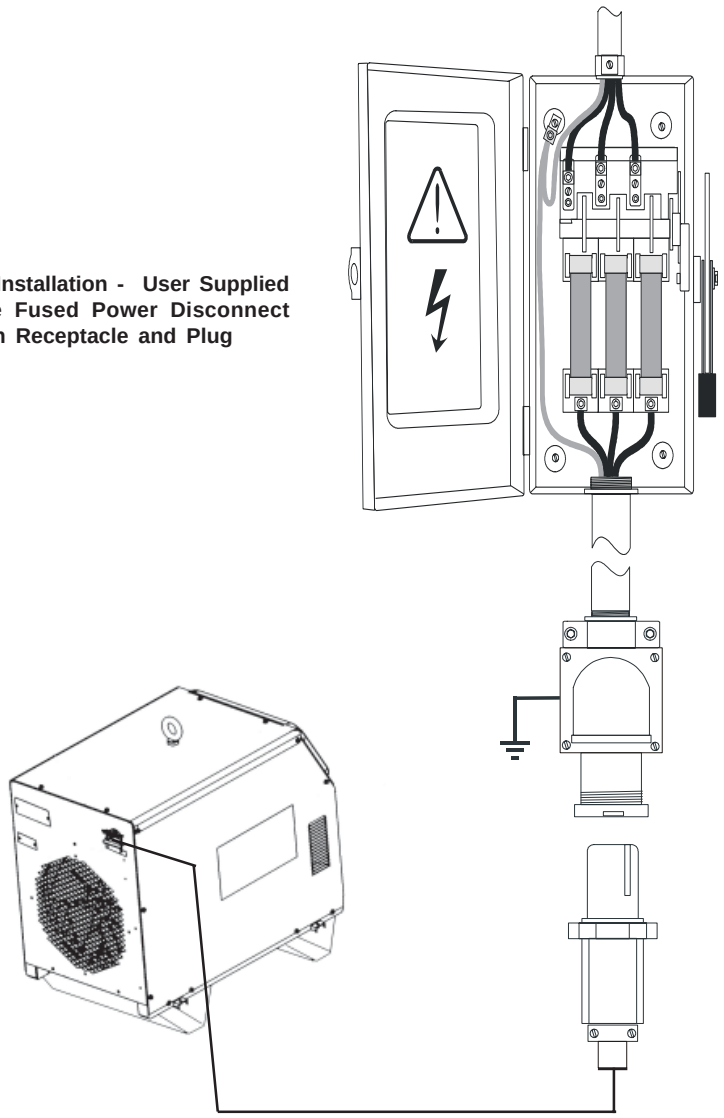
Rated Input @ 100% Duty Cycle		Input & GND Conductor* CU/AWG	Fuse Size Amps
Volts	Amps		
220	68	No. 6	100
230	66	No. 6	100
400	37	No. 8	60
460	33	No. 8	60
575	26	No. 10	50

*Sized per National Code for 80 °C rated copper conductors @ 30 °C ambient. Not more than three conductors in raceway or cable. Local codes should be followed if they specify sizes other than those listed above.

WARNING

ELECTRIC SHOCK CAN KILL! Before making electrical input connections to the power source, "Machinery Lockout Procedures" should be employed. If the connections are to be made from a line disconnect switch, place the switch in the off position and padlock it to prevent inadvertent tripping. If the connection is made from a fuse box, remove the corresponding fuses and padlock the box cover. If it is not possible to use padlocks, attach a red tag to the line disconnect switch (or fuse box) warning others that the circuit is being worked on.

Typical Installation - User Supplied 3 Phase Fused Power Disconnect Box with Receptacle and Plug



WARNING

The chassis must be connected to an approved electrical ground. Failure to do so may result in electrical shock, severe burns or death.

1. The primary power leads must be insulated copper conductors. Three power leads and one ground wire are required. Either rubber covered cable or conduit (flexible or solid) may be used. Table 3-1 provides recommended input conductors and line fuse sizes.

2. Remove the top cover. Identify primary power input connection block, chassis ground lug on the frame, and primary input terminal board. Refer to Figures 3-1 and 3-2.

WARNING

ELECTRIC SHOCK CAN KILL! Before making electrical input connections to the power source, "Machinery Lock-out Procedures" should be employed. If the connections are to be made from a line disconnect switch, place the switch in the off position and padlock it to prevent inadvertent tripping. If the connection is made from a fuse box, remove the corresponding fuses and padlock the box cover. If it is not possible to use padlocks, attach a red tag to the line disconnect switch (or fuse box) warning others that the circuit is being worked on.

3. When using the provided strain relief, refer to Figure 3-1 for proper cable strip lengths. It is important to follow the cable strip guide to ensure that if the primary input cable is ever pulled from the strain relief, the input conductors will be pulled from the Terminal Block before the ground lead is pulled from the ground lug. Once stripped, thread the input and ground conductors through the large strain-relief in the rear panel of the power source. Connect the ground wire to the terminal lug located on the "A" frame support. Connect the primary power leads to terminals L1, L2, and L3 on the input power block. Secure the strain relief on the input cable.

4. Check all connections for proper tightness. Ensure all connections are correct and well-insulated.

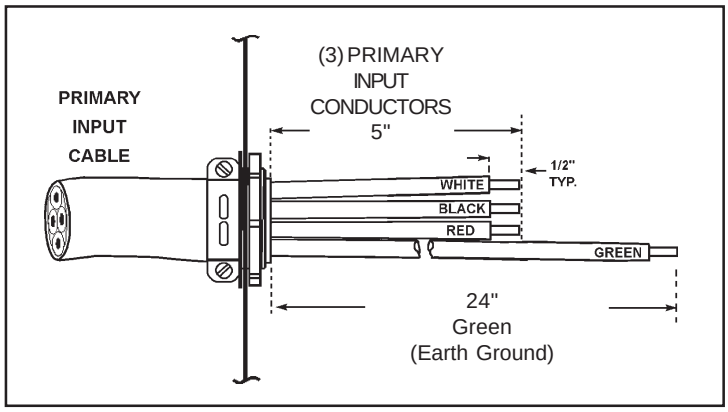


Figure 3-1 Recommended Cable Strip Lengths

WARNING

The chassis must be connected to an approved electrical ground. Failure to do so may result in electrical shock, severe burns or death.

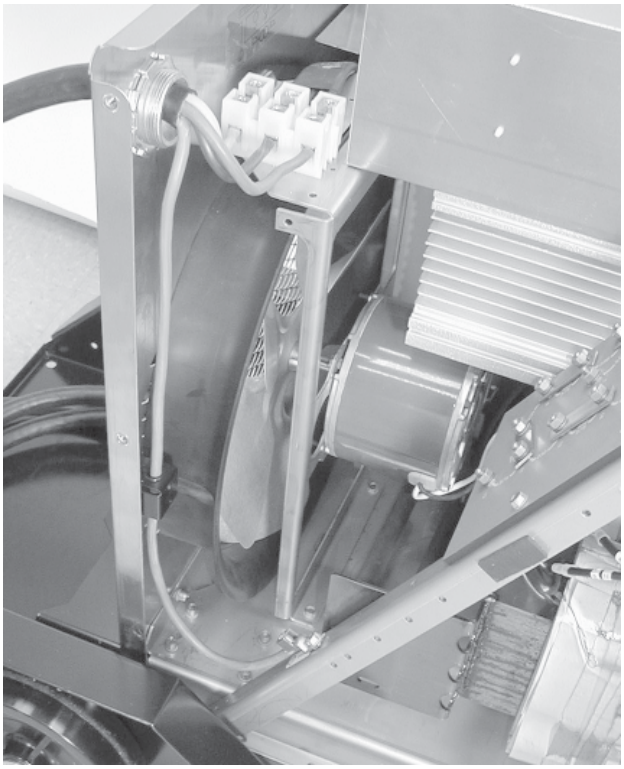


Figure 3-2 Primary Power Leads L1,L2, L3 & Ground

5. Figures 3-3, 3-4 and 3-5 illustrate the input voltage terminal boards and the input voltage link connections. The particular voltages from which this power source may be operated are stated on the rating plate. The voltage links were factory set for highest voltage stated on the rating plate (575VAC). If the power source is to be operated on another stated input voltage, the links must be reset for that particular input voltage. Always verify the input voltage and check the link arrangement regardless of factory setting. The voltage links are set up by reconfiguring the copper link bars to the silk-screened voltage designations for the desired voltage.

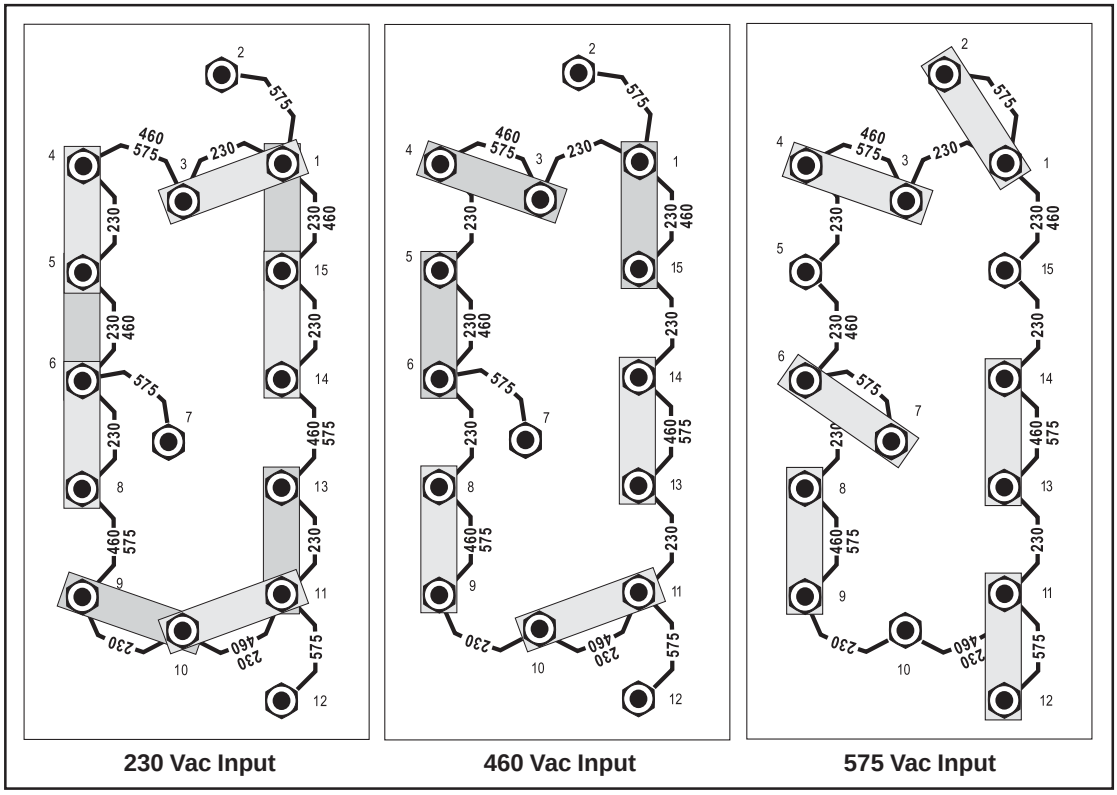


Figure 3-3. Input Terminal Board Configuration for 230/460/575 Model (factory supplied in the 575 configuration)

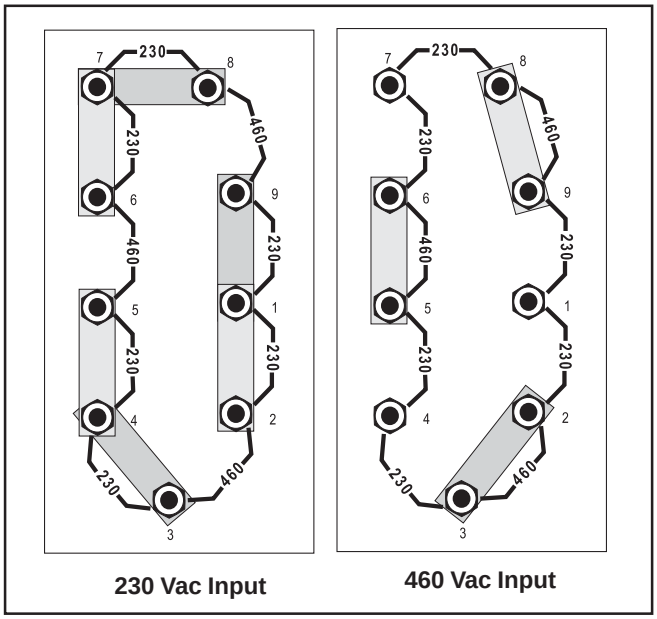


Figure 3-4 Input Terminal Board Configuration 230/460 Model (factory supplied in the 460 configuration)

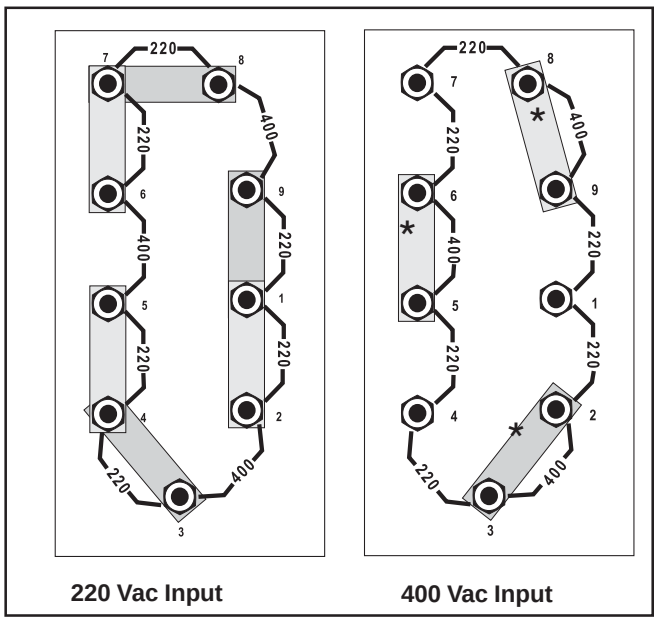


Figure 3-5 Input Terminal Board Configuration 220/400 Model (factory supplied in the 400 configuration)

D. OUTPUT WELDING CONNECTIONS (SECONDARY)

WARNING

Check the voltage links for proper voltage on the Input Terminal board before applying primary power.

The output connections are located on the front panel (Figure 2-5). The positive connection is located at the bottom left corner and the negative connection is located at the bottom right corner. Table 3-2 provides the recommended secondary cable output sizes.

1. CONNECTIONS FROM THE WIRE FEEDER

The wire feeder control cable connects to the 19 pin J1 receptacle on the lower front left of the MultiPower 460. The secondary output cable connects (in most cases) between the positive output lug of the MultiPower 460 and the power connection block of the wire feeder. See the wire feeder installation instructions for other connections such as shield gas, water, remote controls, Mig guns and wire feeder operation.

WARNING

Before making any connections to the power source output terminals make sure that all primary input power to the machine is off.

2. CONNECTIONS FOR STICK AND TIG WELDING

The Tig torch and stick electrode holder connect directly to the appropriate MultiPower 460 output lugs on the lower front panel. The choice of the Positive or Negative terminal depends on the welding process and electrode type being used. In most cases the Tig torch will connect to the negative lug and work cable will connect to the positive lug. The stick electrode holder usually connects to the positive lug and the work cable to the negative lug.

Table 3-2. Output Cable Sizes (Secondary)

Welding Current	Total Length (Feet) of Cable in Weld Circuit*				
	50	100	150	200	250
100	6	4	3	2	1/0
150	4	3	1	1/0	2/0
200	3	1	1/0	2/0	3/0
250	2	1/0	2/0	3/0	4/0
300	1	2/0	3/0	4/0	4/0
400	2/0	3/0	4/0	4/0	2-2/0
500	3/0	3/0	4/0	2-2/0	2-3/0

* Total cable length includes work and electrode cables. Cable size is based on direct current, insulated copper conductors, 100-percent duty cycle and a voltage drop of 4 or less volts. The welding cable insulator must have a voltage rating that is high enough to withstand the open circuit voltage of the power source.

4.0. OPERATION

CAUTION

Never operate the power source with the covers removed. In addition to the safety hazards, improper cooling may cause damage to the components. Keep side panels and top closed when unit is energized. Welding helmet, gloves, and other personal protection should always be worn when welding.

A. WIRE FEEDER COMPATIBILITY

The MultiPower 460 power source can be used with several ESAB 42 volt wire feeders. The model wire feeder being used will determine the setup method and operator interface. The position of the REMOTE/PANEL switch determines the location of the voltage preset and TRIM locations. The wire feed speed is always set from the wire feeder using the wire speed knob on the feeder control panel. To see the preset wire feed speed, press the PRESET button on the MultiPower 460 control panel. Use Table 4-1 to determine the switch position of operator preference. In most Mig welding applications, the switch will be in the REMOTE position and the wire feed speed and voltage will be adjusted from the wire feed front panel.

Table 4-1. Wire Feeder Compatibility

		MIG MODE SWITCH*			
		STANDARD (MultiPower 460)		PULSE (MultiPower 460 Pulse)	
Wire Feeder	**Arc Trim Location from:**	**PANEL**	**REMOTE**	**Synergic**	**Non-Synergic****
Mig 4HD	Feeder		X	X	Optional
DuraDrive 4-30	MP-460 Panel	X		X	Optional
DuraDrive 4-48					
Mig 2E	Feeder	X	N/A		
Mig 5XL	Remote Pendant		X	X	Optional
(Mongoose)	MP-460 Panel	X		X	Optional
MobileMaster IV	Feeder	X	N/A	N/A	X
(Off the Arc)					
Mini 8	Remote Pendant		X	N/A	X
(Off the Arc)	MP-460 Panel	X		N/A	X

N/A - Not Available
* - Process switch MUST be in the MIG position.
** - See Synergic/NonSynergic description section for configuration information (Applies to MultiPower 460 Pulse only)

NOTE

Wire Feeders with 115VAC contactor control circuitry cannot be connected to the MultiPower 460.

NOTE

Wire Feeders with remote voltage control must be disconnected before Tig & Stick current can be controlled by the remote control pendant.

B. DIGITAL DISPLAY METERS

The digital displays located on the left side of the control panel are multifunctional depending on the welding process being used. The MultiPower 460 digital display meters permit preset of the wire feed speed on wire feeders without digital displays. A Mig 2E, 4HD or DuraDrive 4-30 or 4-48 will not need digital meters to preset the wire feed speed. The wire feed speed can be displayed on the MultiPower 460 panel meter.

NOTE

The digital wire feed speed meter on the MultiPower front panel reads a maximum of 760 ipm. Some wire feeders have speed ranges that exceed this maximum limit of the digital meter. Wire feed speeds above 760 ipm will be displayed at 760 ipm.

C. MIG WELDING

In the MIG process mode, the digital displays will read preset wire feed speed in inches per minute and preset arc volts when the PRESET button is pressed. Once welding begins, the displays will show average welding current and volts in the top and bottom display, respectively. The displays have a “HOLD” circuit that retains the welding conditions. After welding stops, the display will continue to show the last average welding current and voltage sampled for 10 seconds, then returns to “0”.

NOTE

The digital volt meter on the MultiPower front panel reads a maximum of of approximately 75 Vdc even if the OCV (Open Circuit Voltage) is higher. The MultiPower 460 has the following OCV"s:

STICK 75 to 80 Vdc
TIG - 38 to 42 Vdc
MIG - 11 to 44 Vdc

D. TIG and STICK WELDING

In the TIG and STICK process mode, you must depress and "HOLD" the PRESET button while presetting the welding current in the top display. Releasing the preset button causes the display to return to zero. Once welding begins, the display will show average welding current and volts in the top and bottom display, respectively. After welding stops, the current display will again

return to zero. There is no "HOLD" circuit for the display meters when using the TIG and STICK process modes.

E. MIG WELDING PRESET PROCEDURE

When the PROCESS switch is placed in the MIG position, the MultiPower 460 is set for CV (constant voltage) welding. The power source will output open circuit voltage (OCV) when the Mig Gun trigger is depressed. The following procedure assumes the wire feed and voltage adjustments will be made from the wire feeder front panel and wire and gas have been installed.

Step 1. Connect wire feeder to MultiPower 460 and set PANEL/REMOTE switch to REMOTE position.

Step 2. Place the WELD PROCESS switch in the MIG (center) position.

Step 3. Press and release the PRESET button then turn the wire speed control on the wire feeder to the desired speed shown on the top digital display window of the MultiPower 460.

Step 4. Turn the VOLTAGE knob on the wire feeder to the desired arc voltage in the bottom digital display window of the MultiPower 460.

Step 5. Set the shielding gas flow rate to 35 cfh by activating the gas purge switch on the wire feeder or pulling the gun trigger and turning the adjustment knob on the Flowmeter.

NOTE

"OFF THE ARC" Wire Feeders can use either MIG (CV) or STICK (CC) Process Selection. Place the contactor toggle switch on the accesssory panel (see Figure 2-5) to the "ON" position.

Figure 4-1 Standard Mig Setup Procedure

Step 6. Connect the work cable to the part to be welded and pull the gun trigger to start welding. Trim the wire speed and volts as needed for the desired arc characteristics and weld quality.

NOTE

The FC-5B foot control or TC-2B hand control must be used with the MP-460 for remote current Tig current control.

F. TIG WELDING

When the PROCESS switch is placed in the TIG position, the MultiPower 460 is automatically set for CC (constant current) welding using the ESAB Touch TIG starting method. The voltage and current at the output lugs is maintained at low values until the tungsten electrode is shorted to the workpiece.

Step 1. Be sure to set the polarity to DCEN (Electrode Negative) by connecting the Tig torch to the negative terminal lug on the front of the power source.

Step 2. Place the WELD PROCESS switch in the TIG position.

Step 3. Place the PANEL/REMOTE switch in the PANEL position.

Step 4. While depressing the PRESET button, turn the VOLTAGE/CURRENT knob to the desired weld current as displayed on the top digital display window.

Step 5. Set the shielding gas flow rate to 20 cfh by adjusting the control knob on the flowmeter.

Step 6. Touch the tungsten electrode to the workpiece momentarily then lift 1/16" off the workpiece to establish the welding arc. Trim the weld current as desired by turning the VOLTAGE/CURRENT knob.

NOTE

When using a DuraDrive wire feeder (or any wire feeder with Remote Voltage control from the feeder front panel) connected simultaneously with a remote current control Tig device (FC-5B or TC-2B), proportional control of the TIG remote current will be controlled by the position of the feeder voltage control knob when the PANEL/REMOTE switch is in the REMOTE position. When in the PANEL position the maximum current of the remote device is controlled by the MP-460 front panel current control preset.

NOTE

If a Foot Control or Remote Hand Control is used for continuous current control, place the PANEL/REMOTE switch in the PANEL POSITION and set the Panel Current knob to the maximum desired weld current. The remote device will then control the current between minimum and the maximum setting preset (proportional current control). Maximum Tig weld current is 525 amps.

NOTE

If the MP-460 PANEL/REMOTE switch is left in the REMOTE position when Tig welding while using a remote current control device, the current range will be full scale or 10 to 400 Amps. Limiting the the maximum weld current (proportional current control) using the currnet control on the MP-460 front panel is defeated.

Figure 4-2 Standard Tig Setup Procedure

G. STICK WELDING

When the PROCESS switch is placed in the STICK position, the MultiPower 460 establishes open circuit voltage (OCV) and output power is immediately available for welding. This means that the STICK electrode holder is "HOT", and an arc will strike when the electrode comes in contact with the workpiece or any other object at ground potential.

CAUTION

When the WELD PROCESS switch is moved to the TIG or STICK position, electrode becomes electrically "HOT". Do not allow the electrode to contact ground potential until you are ready to make a weld.

Arc Force is automatically enabled when the WELD PROCESS switch is set to the STICK position. The level of Arc Force is automatically adjusted by the current preset being used.

Step 1. Be sure to set the polarity to DCEP (Electrode Positive) by placing the Electrode Holder cable in the Positive connection lug on the front of the power source.

Step 2. Place the WELD PROCESS switch in the STICK position.

Step 3. Place the PANEL/REMOTE switch in the PANEL position.

Step 4. While holding the PRESET button, turn the VOLTAGE/CURRENT knob to the desired weld current in the top digital display window.

Step 5. Strike the electrode on the workpiece and start welding. Trim the welding current as needed for the desired weld pool control.

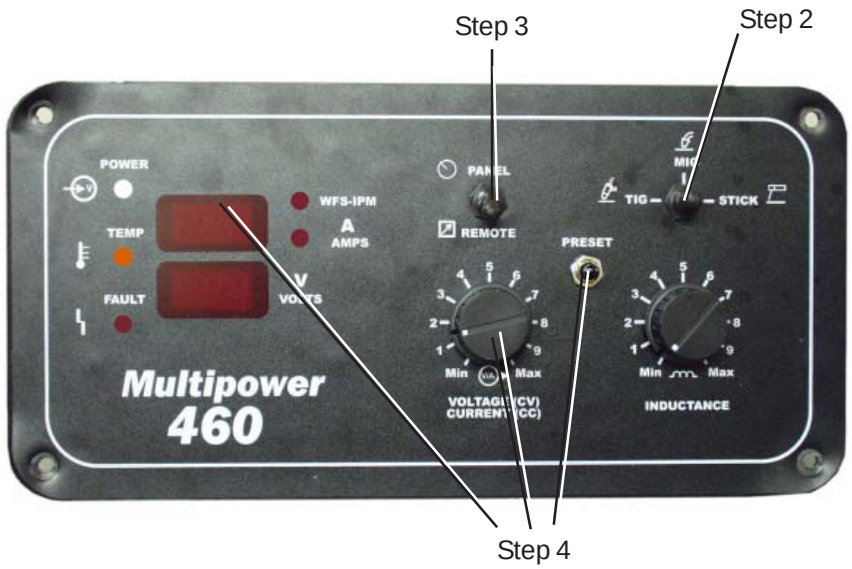


Figure 4-3 Standard Stick Setup Procedure

H. AIR CARBON ARC GOUGING (CAC-A)

1. CONSTANT CURRENT and CONSTANT VOLTAGE GOUGING

Step 1. Place the Output PANEL/REMOTE switch into PANEL position if output current is regulated from the VOLTAGE/CURRENT knob on the power source front panel, or in REMOTE position if output current is regulated from the optional Hand Control.

Step 2. Place the Process Control switch in the STICK position.

Step 3. Press and hold the PRESET button and set the VOLTAGE/CURRENT knob to gouging current.

CAUTION

When the WELD PROCESS switch is moved to the TIG or STICK position, electrode becomes electrically "HOT". Do not allow the electrode to contact ground potential until you are ready to make a weld.

Step 4. **CV-Carbon Arc Gouging Only** - Place the Process Switch in the MIG position and the Contactor Toggle switch to the "ON" position. See Figures 4-4 and 4-5.

Step 5. Turn the air on the gouging electrode holder "ON and start gouging by touching or scratch starting the electrode.

NOTE
Due to the "Built-In" Arc Force in the stick mode, the actual current may be greater than the preset value.

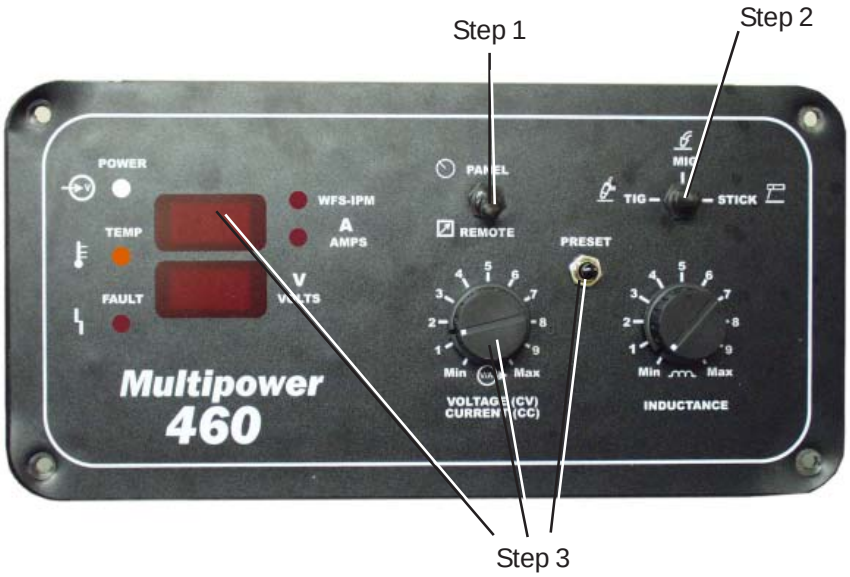


Figure 4-4 Carbon Arc Setup Procedure

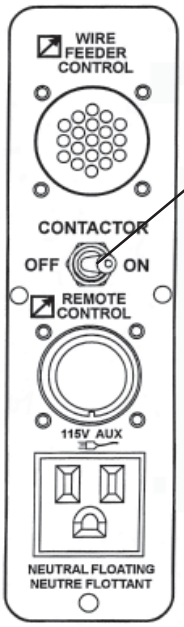


Figure 4-5 Contactor Switch for Carbon Arc Setup

For CV Carbon Arc Gouging and "Off the Arc" wire feeders ONLY!!!!!!!

5.0 MAINTENANCE AND TROUBLESHOOTING

A. CLEANING

Periodically, remove the cover from the power source and blow accumulated dust and dirt from the air passages and interior components by using clean low pressure air. The frequency of cleaning required depends upon the environment in which the power source is used.

It is imperative that all air passages be kept as clean as possible in order to allow adequate air flow to provide proper cooling.

After cleaning with low pressure air, check for and tighten any loose hardware, including all electrical connections. Check for frayed and/or cracked insulation on all power cables and replace if necessary.

B. INSPECTION AND SERVICE

Keep the power source dry, free of oil and grease, and protected at all times from damage by hot metal and sparks.

C. FAN MOTOR

Keep the fan motor free of accumulated dust and lint.

D. TRANSFORMER

Other than periodically cleaning the dust and dirt from the transformer, no maintenance is required. Ensure that only clean, dry, low pressure air is used.

E. WIRE FEEDER CONTROL CIRCUITS

These circuits are protected by two 10 amp circuit breakers mounted in the front panel. If these open, the contactor and wire feeder will not operate.

F. OVER TEMPERATURE PROTECTION

If the power source reaches an abnormally high internal temperature, the thermal protection will deenergize the contactor circuit, shutting down the power source but leaving the cooling fan on. After the power source has cooled to a safe level, the thermal protection will automatically reset. While de-energized, the contactor and wire feeder cannot be operated.

G. TROUBLESHOOTING

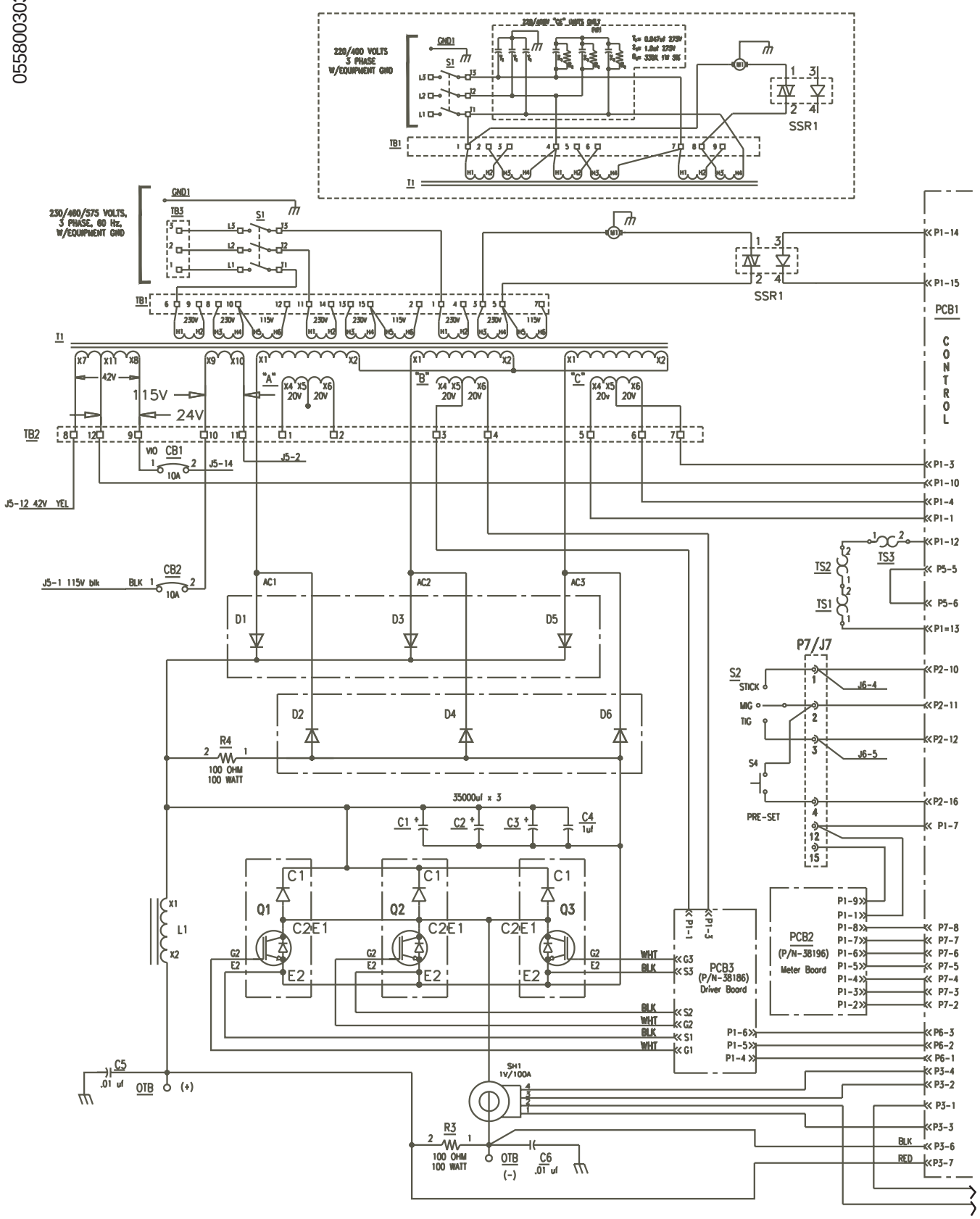
If the power source is operating improperly, the following troubleshooting information may be used to locate the source of the trouble.

Check the problem against the symptoms in the following troubleshooting guide (Table 5-1.) The remedy for the problem may be quite simple. If the cause cannot be quickly located, open up the unit and perform a simple visual inspection of all the components and wiring. Check for proper terminal connections, loose or burned wiring or components, blown fuses, bulged or leaking capacitors, or any other sign of damage or discoloration.

Table 5-1 Troubleshooting Guide

CONDITION	ACTION
Unit Inoperative	A. No input power. Check main line (user's) switch fuses -- replace if needed. B. Poor or improper input (terminal board) connections. C. Defective on/off switch -- replace. D. Thermal light on. Main transformer overheating. Also check for proper cooling, proper primary hookup, or shorted turn on secondary. E. Loss of primary phase. Find & replace defective fuse.
No Output -- Fan Running	A. Poor or improper electrical input -- check input connections on TB. B. Poor connections at output terminals/work station -- check, tighten or replace. C. Main transformer overheating -- thermal switches tripped due to restricted cooling air. Temperature light on front panel will be lit. Let unit cool down. D. PC board defective or loose PC board connector(s) -- if loose, reinsert; if defective, replace.
Limited Output or Low Open-Circuit Voltage	A. Input voltage jumper links on terminal board improperly set -- check for proper voltage. B. Poor output connections. Take apart, clean, and reassemble. C. Panel-Remote switch in Remote position and remote voltage pot disabled.
Erratic Weld Current	A. Welding cable size too small -- use correct cables. B. Loose welding cable connection (will usually get hot) -- t ighten all connections. C. Improper wire feeder setup. D. PC board defective -- replace.
High Output, No Voltage Control	A. PC board defective or loose -- reset and/or replace board. B. Shorted I.G.B.T. - Replace I.G.B.T. and check driver PCB.
No 115 Volt ac Output	A. Circuit breaker tripped. Check 115V CB2 -- Reset.
Line Fuse Blows When Power Source is First Turned On	A. Shorted DIODE in Main Bridge -- replace. B. Shorted capacitor in Capacitor Bank.
Wire Feeder is Inoperative	A. Loose feeder control cable -- Check and tighten all connections. B. A Circuit Breaker tripped -- Check 42V CB1-- Reset.

0558003034-B



Schematic Diagram - MultiPower 460 - 230/460/575V

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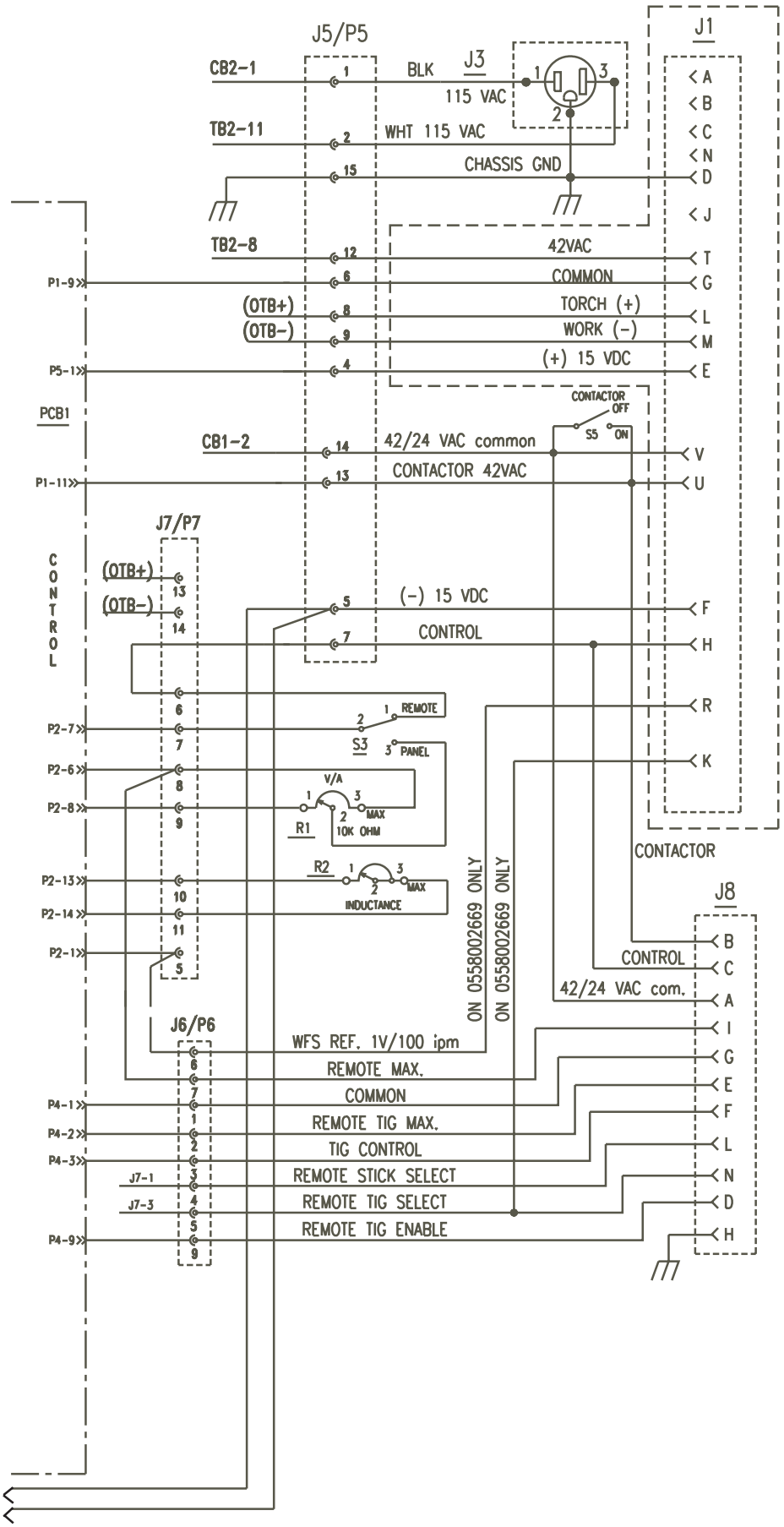
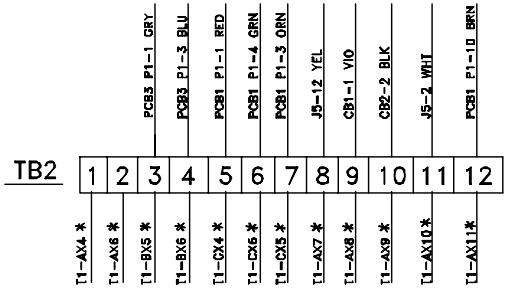
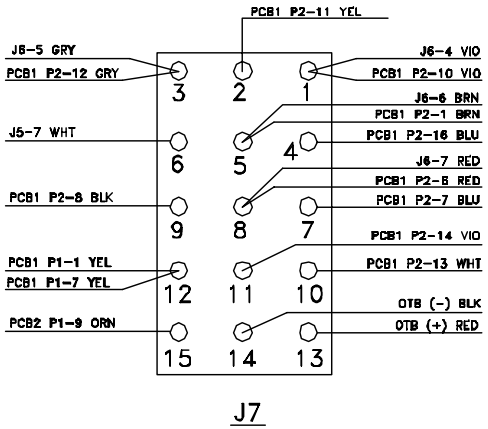


Schematic Diagram (Continued) - MultiPower 460 - 230/460/575V





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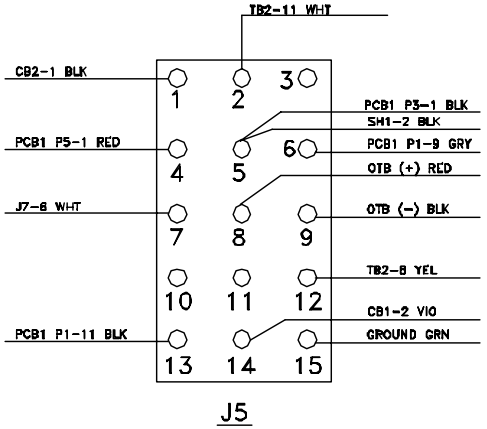

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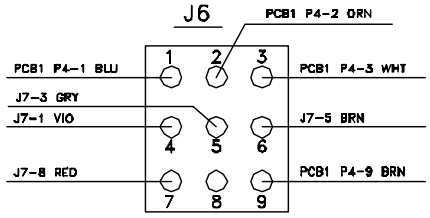
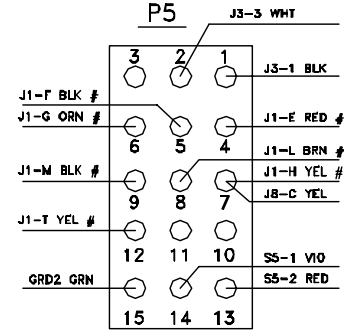
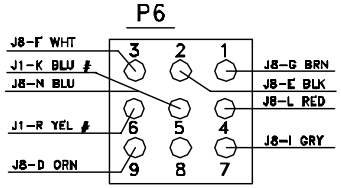
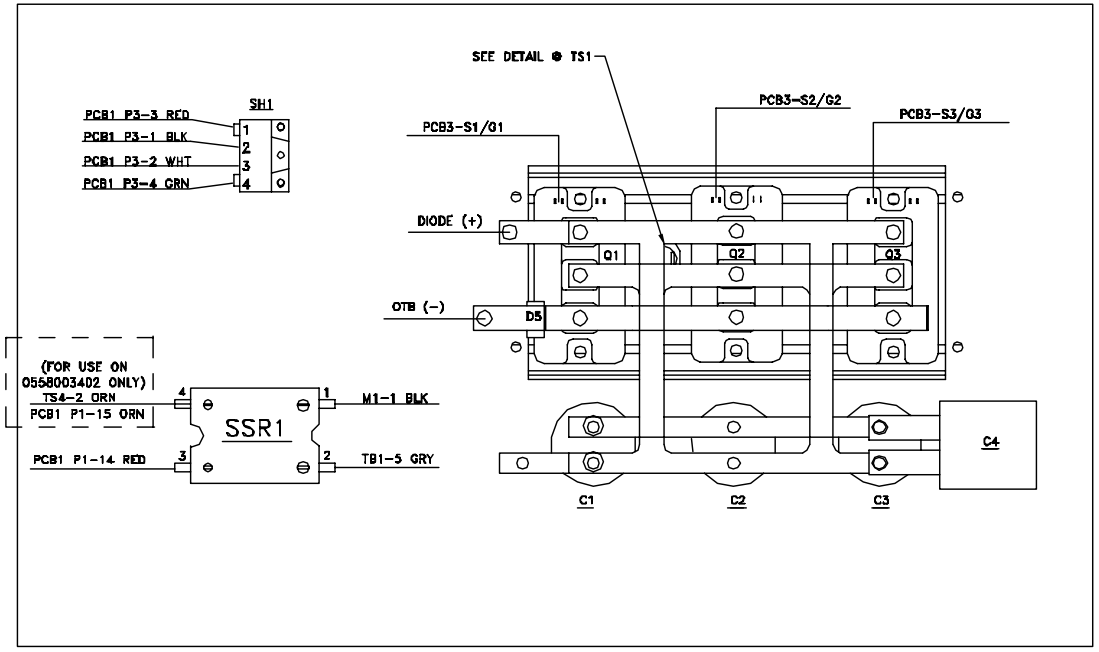


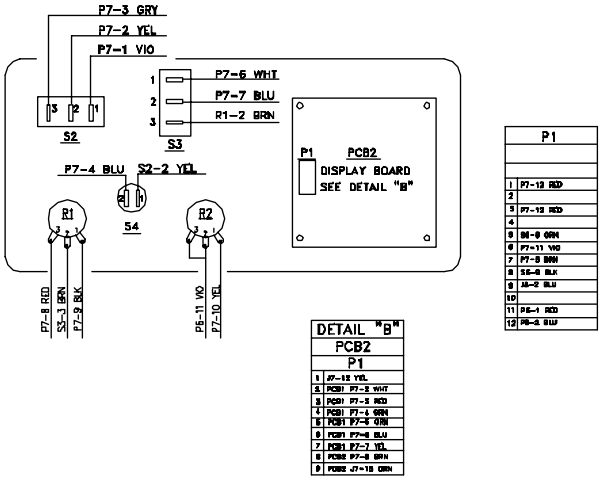






NOTES:
1. • DENOTES SPLICE.
2. * DENOTES SELF LEAD.
3. # DENOTES 0558002669, 0558002877, & 0558003401 ONLY.

(STANDARD)
CONTROL PANEL REAR



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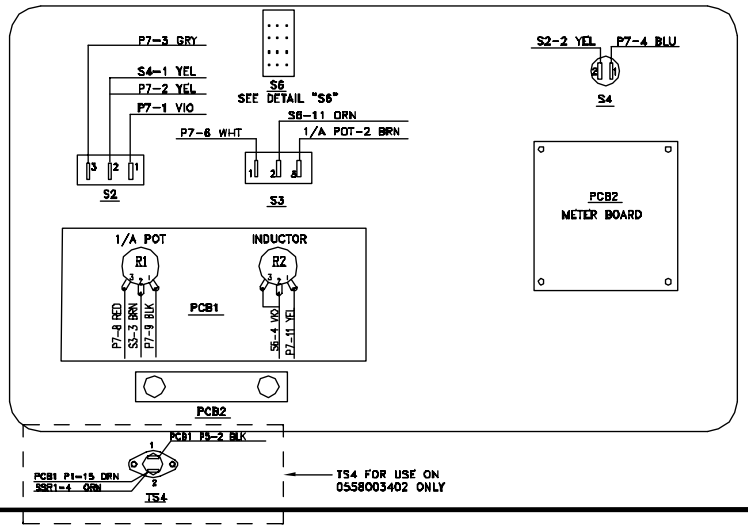

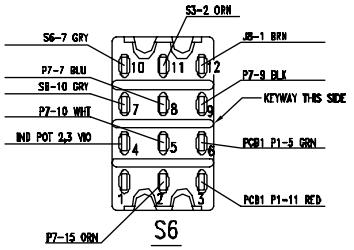

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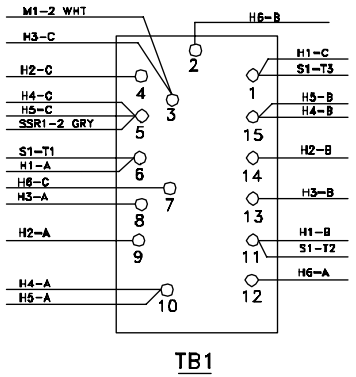
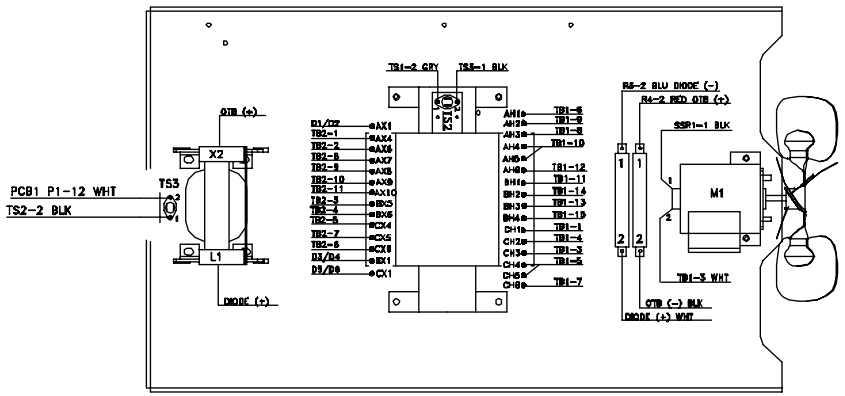
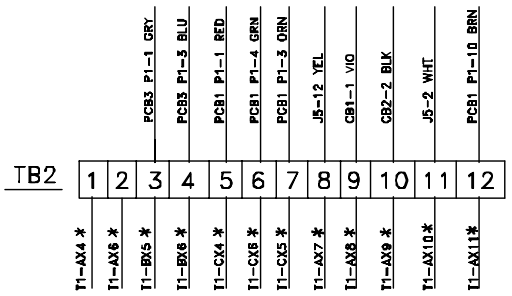
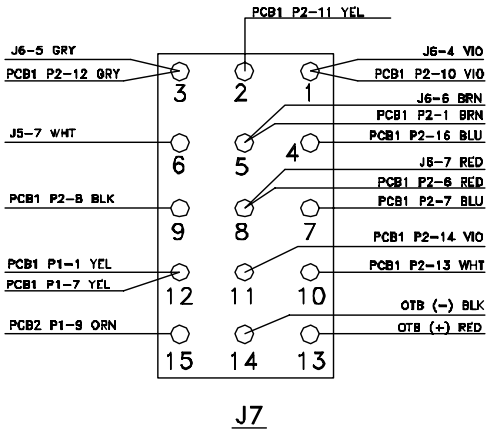




NOTES:
1. ◦ DENOTES SPLICE.
2. * DENOTES SELF LEAD.
3. # DENOTES 0558002659 & 0558002877 ONLY.





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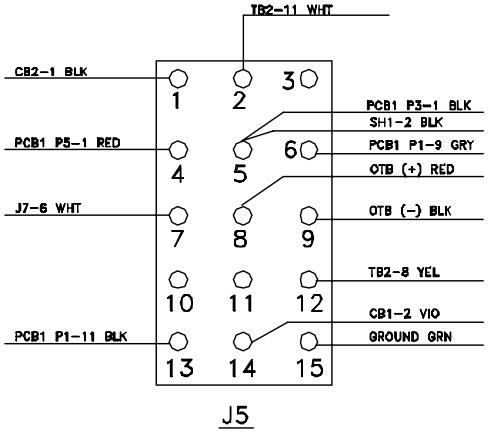

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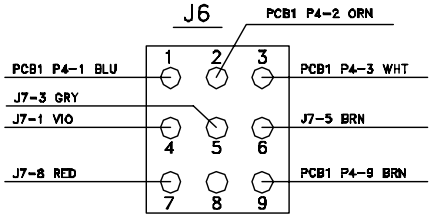
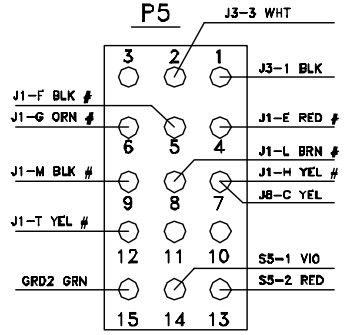
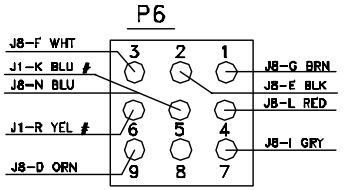
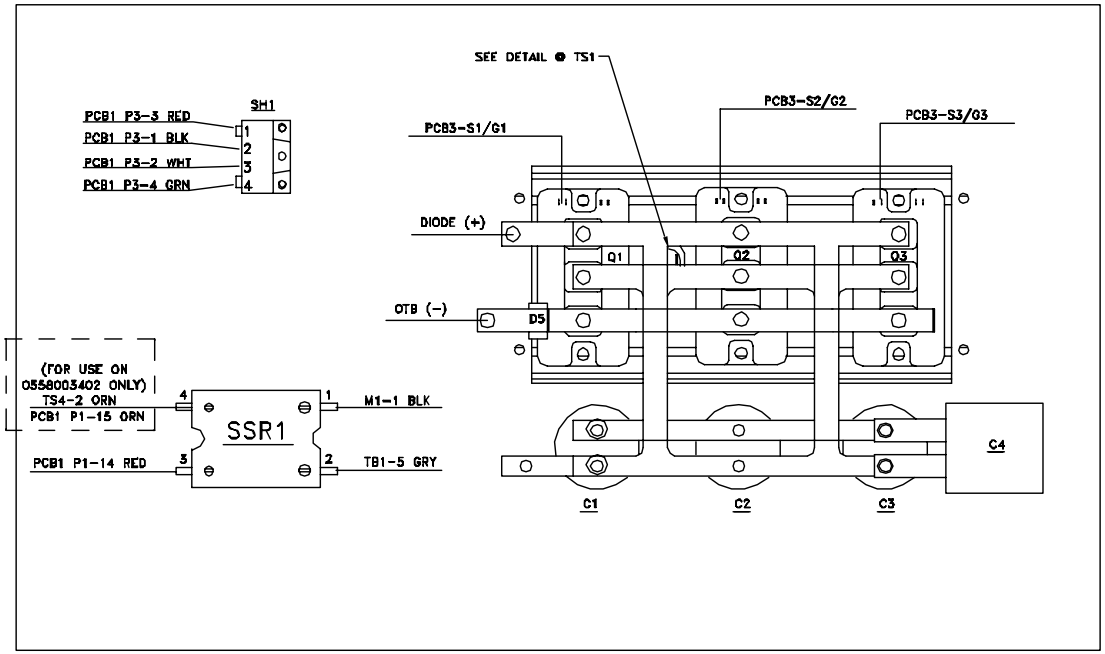
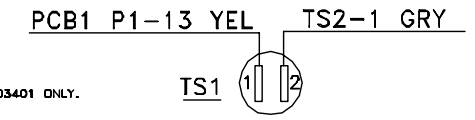










NOTES:
1. • DENOTES SPLICE.
2. * DENOTES SELF LEAD.
3. # DENOTES 0558002669, 0558002877, & 0558003401 ONLY.

A. REPLACEMENT PARTS

Replacement Parts are illustrated on the following figures. When ordering replacement parts, order by part number and part name, as illustrated on the figure. Always provide the series or serial number of the unit on which the parts will be used. The serial number is stamped on the unit nameplate.

B. ORDERING

To assure proper operation, it is recommended that only genuine ESAB parts and products be used with this equipment. The use of non-ESAB parts may void your warranty.

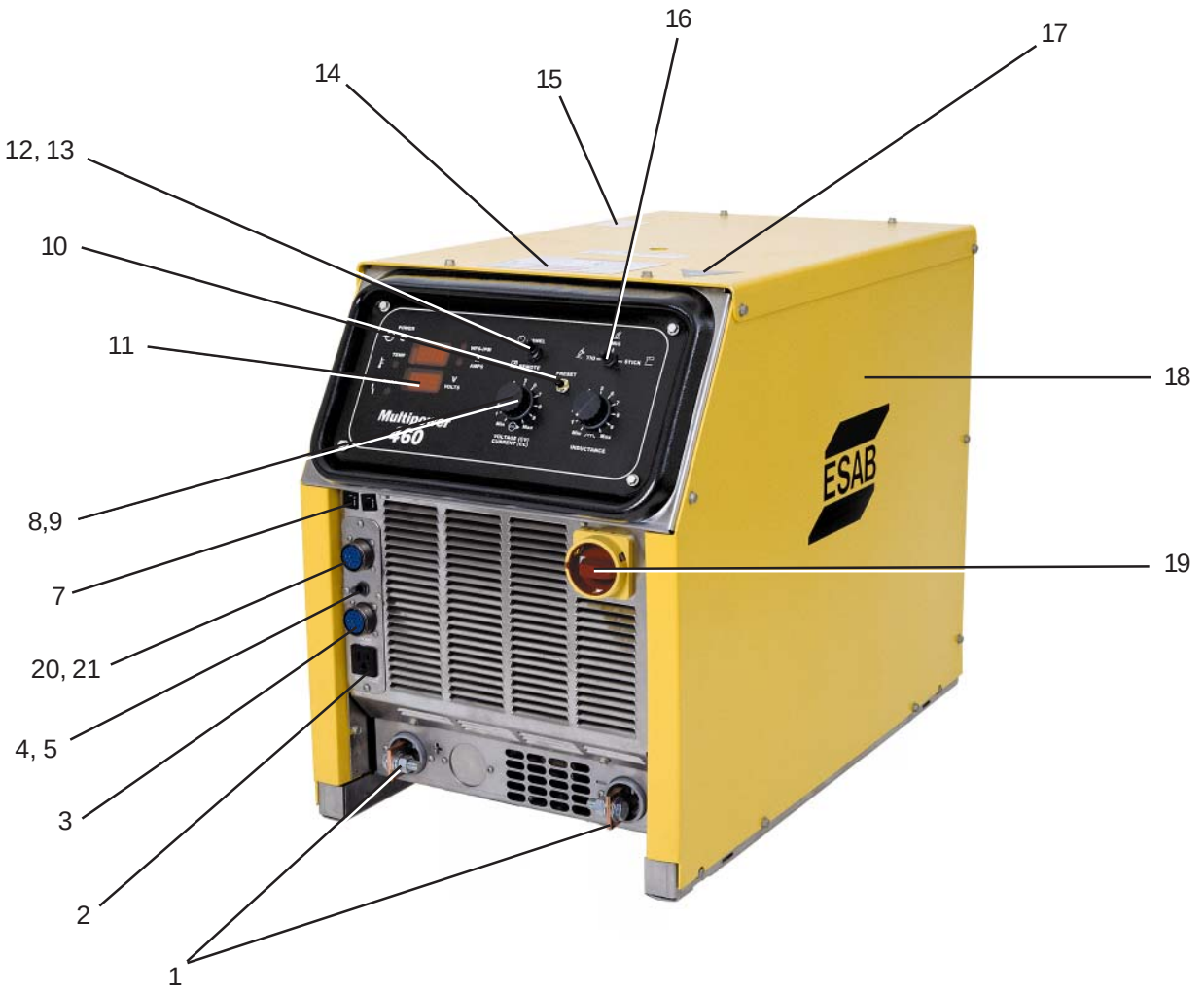
Replacement parts may be ordered from your ESAB distributor or from:

ESAB Welding & Cutting Products
Attn: Customer Service Dept.
P.O. Box 100545, 411 S. Ebenezer Road
Florence, SC 29501-0545

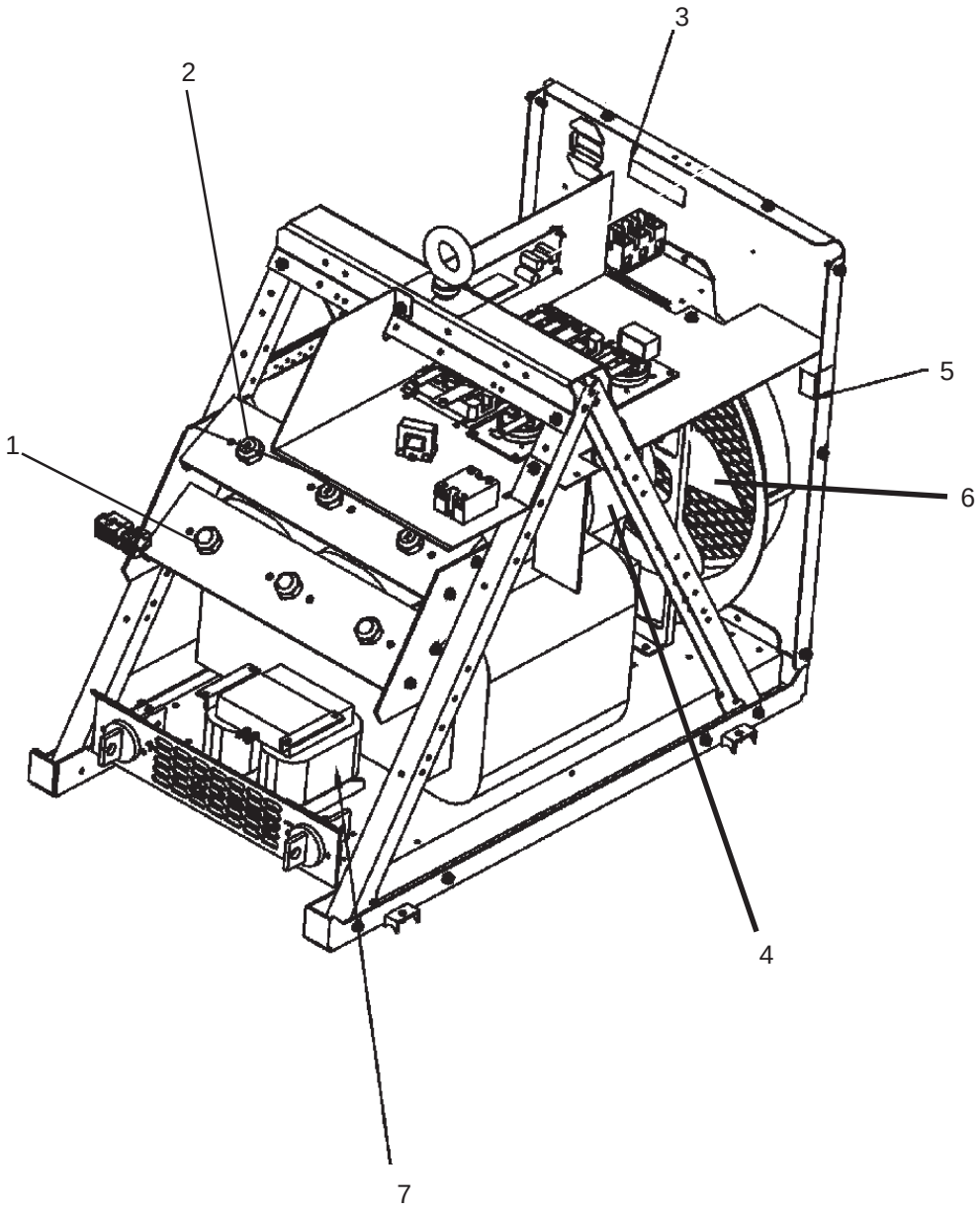
Be sure to indicate any special shipping instructions when ordering replacement parts.

To order parts by phone, contact ESAB at 1-843-664-5540. Orders may also be faxed to 1-800-634-7548. Be sure to indicate any special shipping instructions when ordering replacement parts.

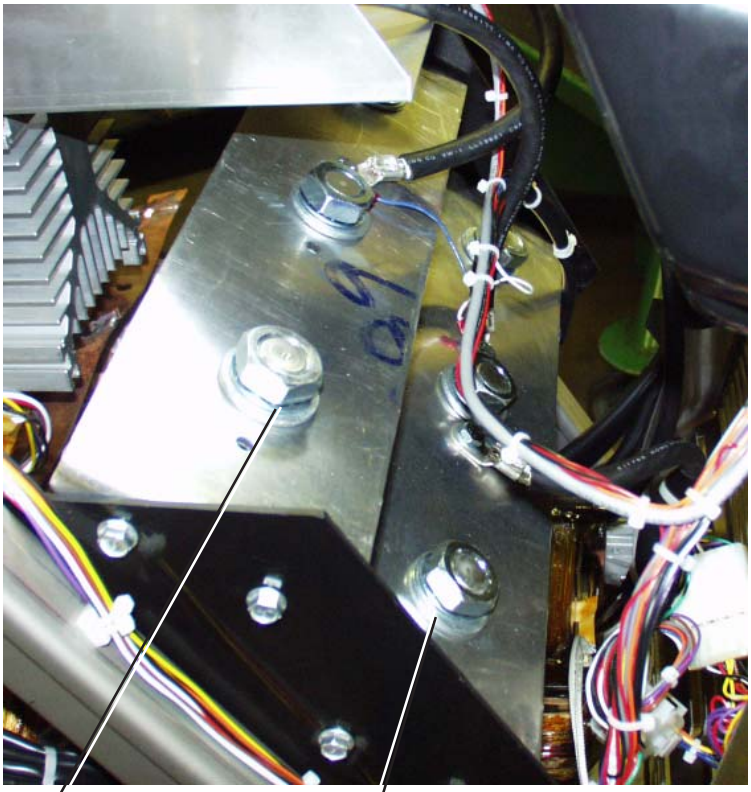
Refer to the Communication Guide located on the last page of this manual for a list of customer service phone numbers.



NO.	QTY. REQ.	ITEM NO.	DESCRIPTION	CIRCUIT SYMBOL
1	2	678025	Terminal Assembly	
2	1	952219	Outlet 110V (Square)	
3	1	951916	Connection Box Rcpt. 14FS X-ROT	
4	2	634515	SW TGGL SPDT 2 Pos 14A 125V Q/D	S3, 5
5	3	951474	Switch Seal Black	
6				
7	2	950122	Ckt Breaker 10A 32VDC/250VAC	CB1, 2
8	2	0558001019	Knob 1.31 Dia.	
9	2	13730632	Pot Lin *10.0K 2.00W 0.88L (A & B)	R1, R2
10	1	952895	Switch PB Normally Open	S4
11	1	38196	PCB Display Assembly	PCB2
12	2	634515	SW TGGL SPDT 2 POS 14A 125V Q/D	S3, 5
13	3	951474	Switch Seal Black	
14	1	2091514	Label Warning Arc Welding & Cutting	
15	1	954008	Danger High Voltage	
16	1	636702	SW TGGL SPDT 3 POS 10A 250V SCR	S2
	3	951474	Switch Seal Black	
17	1	9512240	Label Caution Lifting Eye	
18	1	0558002969	Panel Right Side	
19	1	950945	SW Pwr Disc 100A 600V	S1
20	1	952209	Recpt., Panel, 19-pin F (Shell)	
21	1	0558003003	Connector Plate MP-460	



NO.	QTY. REQ.	ITEM NO.	DESCRIPTION	SYMBOL
1	3	99511916	Diode Fwd 200V 250A	
2	3	99511915	Diode Rev 200V 250A	
3	1	954864	Label 3 Phase	
4	1	2062334	Fan Motor 1/3 HP 1625 RPM	
5	1	954699	Label Warning Fan Hazard	
6	1	36173	Blade Fan 14" 5(or)6 Fin	
7	1	33939	Inductor 7 Turn	
8	1	38186	PCB Assy Driver MM 260	



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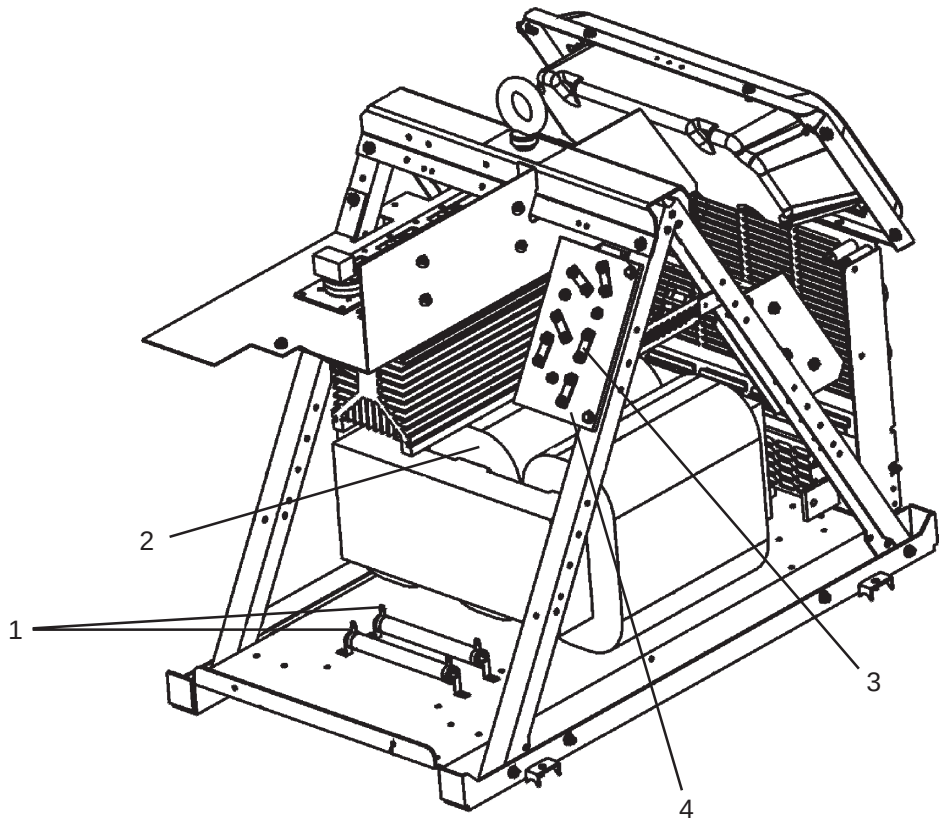
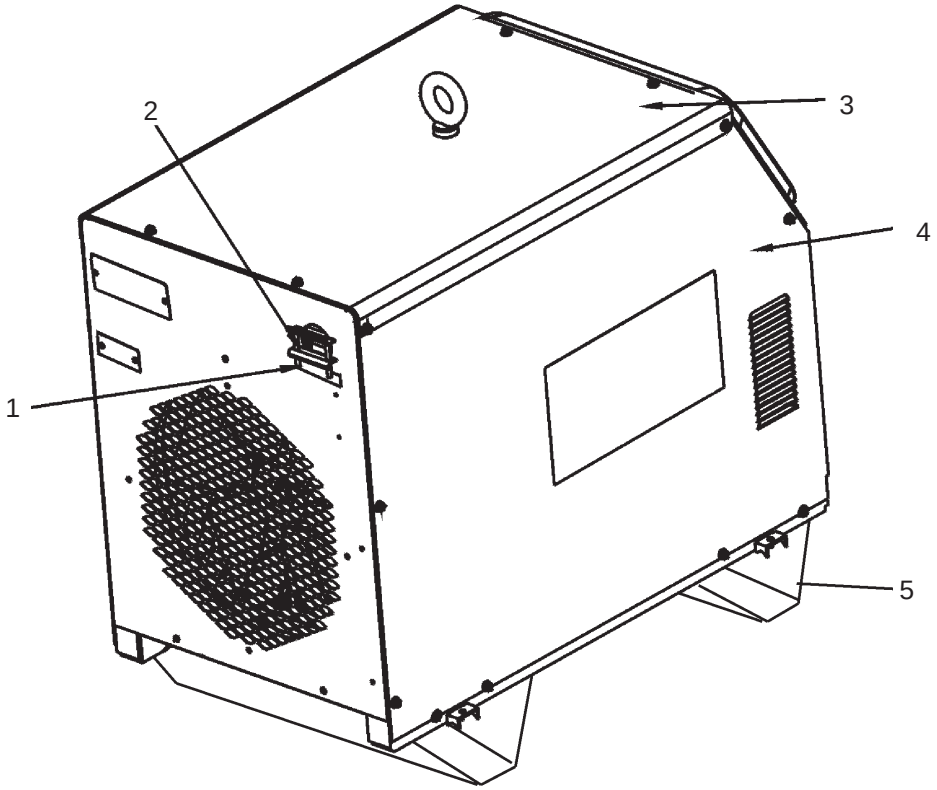
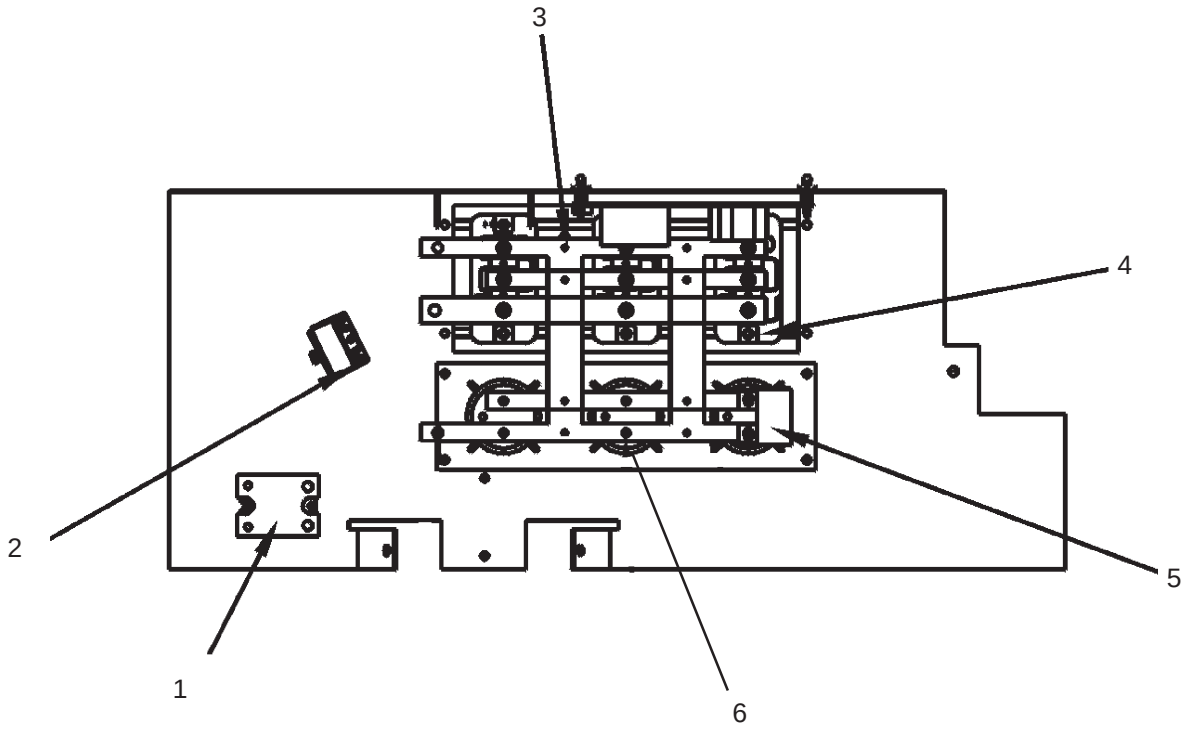


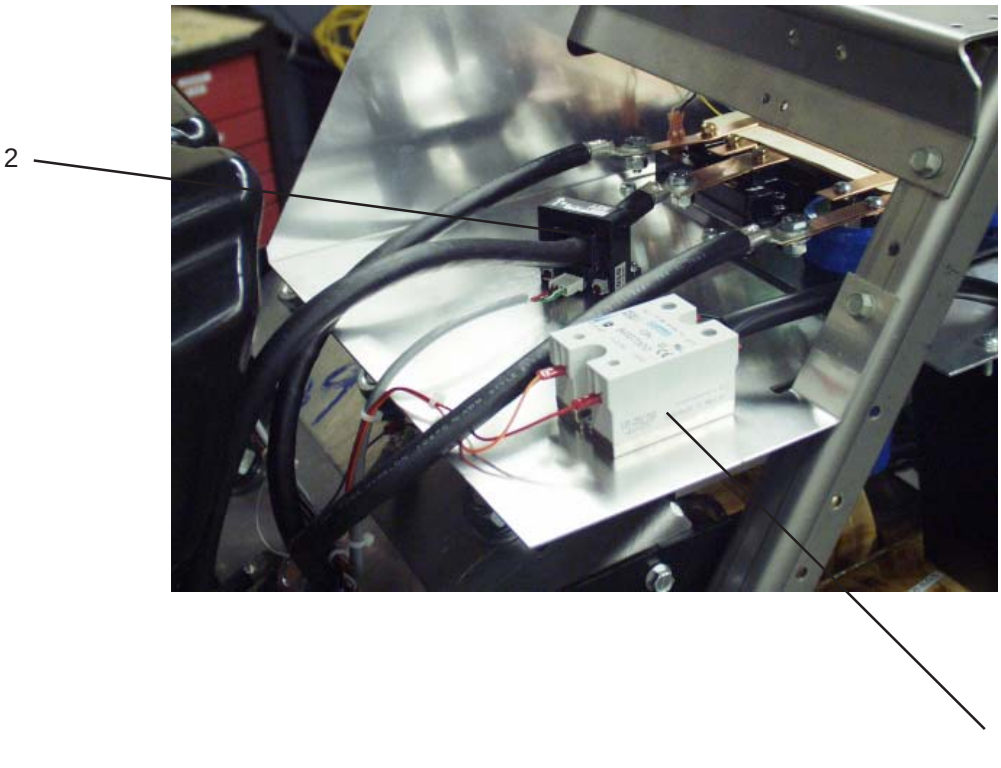
NO.	QTY. REQ.	ITEM NO.	DESCRIPTION	SYMBOL
1	2	17280110	Res WW Fix'd ST 100W 5% 100.00	R3, R4
2	1	0558002712	Transformer 230/460/575V	T1
3	12	672065	Strap Terminal	
4	1	36110	Board Input Terminal 230/460/575V	



NO.	QTY. REQ.	ITEM NO.	DESCRIPTION	CIRCUIT SYMBOL
1	1	1312733	Label for Install Use COP Wire	
2	1	950219	Relief Strain 2" (Non-enclosed)	
3	1	0558001371	Panel Top Kydex Env	
4	1	0558001370	Panel Left Side Kydex Env	
5	2	0558003490	Foot Skid (Shipyard model Only)	



NO.	QTY. REQ.	ITEM NO.	DESCRIPTION	SYMBOL
1	1	952938	SCR 480V 18A Panel MNT	
2	1	951997	Transducer Current	SH1
3	1	951085	SW THML D/T 176 15A 120V Q/D	TS6
4	3	0558002557	IGBT 600V/300A	Q1, 2, 3
5	1	951940	Capacitor 1.0uf 600VDC 10%	C4
6	3	0558002844	Capacitor 35000 UF 100VDC	
7	1	38186	PCB Driver Assy	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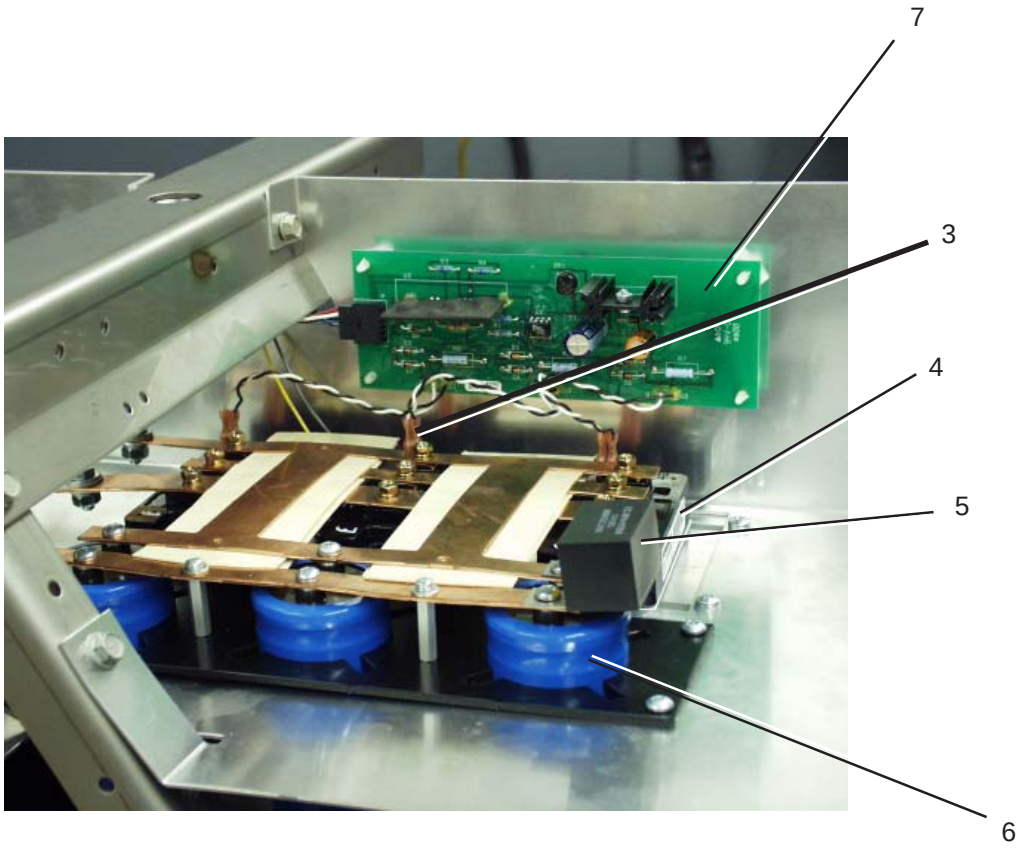
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REVISION HISTORY

Original release of this manual - 05/2003.

Revision A (05SEP03) - Added 19-pin receptacle to illustrations on cover and Pages 15, 29 and 40. Also added Items 20 and 21 to illustration and replacements parts table per Mike Palumbo red-lines. Also updated schematics on Pages 34 thru 37.

10 / 2004 revision - Updated wiring diagram (0558003064) per CN# 043141.

ESAB Welding & Cutting Products, Florence, SC Welding Equipment
COMMUNICATION GUIDE - CUSTOMER SERVICES

A. CUSTOMER SERVICE QUESTIONS:

Order Entry	Product Availability	Pricing	Delivery
Order Changes	Saleable Goods Returns	Shipping Information	

Eastern Distribution Center
Telephone: (800)362-7080 / Fax: (800) 634-7548

Central Distribution Center
Telephone: (800)783-5360 / Fax: (800) 783-5362

Western Distribution Center
Telephone: (800) 235-4012/ Fax: (888) 586-4670

B. ENGINEERING SERVICE: Telephone: (843) 664-4416 / Fax : (800) 446-5693

Welding Equipment Troubleshooting		Hours: 7:30 AM to 5:00 PM EST
Warranty Returns	Authorized Repair Stations	

C. TECHNICAL SERVICE: Telephone: (800) ESAB-123/ Fax: (843) 664-4452

Part Numbers	Technical Applications	Hours: 8:00 AM to 5:00 PM EST
Performance Features	Technical Specifications	Equipment Recommendations

D. LITERATURE REQUESTS: Telephone: (843) 664-5562 / Fax: (843) 664-5548
Hours: 7:30 AM to 4:00 PM EST

E. WELDING EQUIPMENT REPAIRS: Telephone: (843) 664-4487 / Fax: (843) 664-5557

Repair Estimates	Repair Status	Hours: 7:30 AM to 3:30 PM EST

F. WELDING EQUIPMENT TRAINING:
Telephone: (843)664-4428 / Fax: (843) 679-5864
Training School Information and Registrations — Hours: 7:30 AM to 4:00 PM EST

G. WELDING PROCESS ASSISTANCE:
Telephone: (800) ESAB-123 — Hours: 7:30 AM to 4:00 PM EST

H. TECHNICAL ASST. CONSUMABLES:
Telephone : (800) 933-7070 — Hours: 7:30 AM to 5:00 PM EST

IF YOU DO NOT KNOW WHOM TO CALL

Telephone: (800) ESAB-123/ Fax: (843) 664-4452/ Web:http://www.esab.com

Hours: 7:30 AM to 5:00 PM EST

0558004302 **10 / 2004**

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